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NEW CHECK LIST OF BRITISH AGARICS AND BOLETI

PART III. NOTES ON GENERA AND SPECIES IN THE LIST

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(With 514 Text-figures)

Introduction

Having been responsible for the larger part of the work on the 'New Check List' (hereinafter called the 'List'), I would like to make a few general remarks about the nomenclature and taxonomy of agarics.

I have seen it stated that we shall never attain correct author citations for our agaric binomials and that the time spent in achieving this would be wasted. This defeatist attitude is one with which I cannot agree. On the other hand, Singer in his monumental work on world agarics states (*Lilloa*, **22** (1951), 126): 'Generally it is felt that, if ever, nomenclature must be brought into accordance with the rules—now' and later 'in the opinion of the majority of those concerned with issues of nomenclatorial order, it is bad policy to keep inconvenient but legal names in the dark, hoping that nobody will discover them'. This expresses precisely my views on the subject. Having been fortunate enough to be able to devote most of my working hours collecting and studying agarics during the last four years, I have spent much time each winter on the necessary bibliographical work and have made bold to attempt to fix author citations for our agarics and to include dates of publication in the 'List'. The inclusion of these dates seem to me to supply a much needed want, for there is no list or book, to my knowledge, which supplies this information with any completeness or accuracy. I have not been able to trace all names to their sources myself, but have checked the great majority; even so I am afraid it is inevitable that there will be some errors and omissions in such a large list. Any author wishing to dispute any of my dates or citations which are not in agreement with those in general use will, I hope, first take the trouble to check the original sources.

In tackling this work I, like others before me, have been struck by the rather careless character of some of the work on agarics both in this country and abroad during the last seventy years. If we are to make progress in the study of this highly critical group, workers will in future have to be prepared to use much more careful methods (not only practical but also nomenclatural). That some of the earlier authors gave microscopical details which have since proved inaccurate is perhaps not surprising,

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but the copying of translations of Fries's descriptions word for word from author to author complete with errors, typographical and otherwise, has lowered the value of their works. Though a certain amount of compilation is inevitable in any work on a large group, such as the agarics, works which are entirely or mostly compilations are of very much less value than those based on personal observation. The works of Kühner (*Galera*, 1935; *Mycena*, 1938), J. E. Lange (*Flora Agaricina Danica*, 1935–40), A. H. Smith (*Mycena*, 1948), Favre (1948 and 1955), F. H. Møller (*Danish Psalliota Species*, 1950–51) and Kühner & Romagnesi (*Flore Analytique*, 1953) illustrate the value of publications based for the most part on personal observations. It would be a great service to agaricology if all monographs or agaric floras of the future could be based at least for the most part on personal observations with first-hand descriptions and figures.

In more recent times further difficulties have arisen owing to disregard of or misapplication of the *International Code of Botanical Nomenclature*. No rules which will please everybody can be devised, but the present code has been accepted by majority votes at International Congresses and it is now up to us to apply it to the best of our ability, whether we agree with it or not. Works in which the Rules are deliberately disregarded immediately lose value in the eyes of posterity. Any inconvenience over change of name from strict application of the *Code* need be only temporary, since it is only the present generation who will need to learn fresh names if the Rules are universally and carefully applied and the names are based on sound taxonomy. If future generations can be brought up on a reasonably stable nomenclature then they will be spared much unnecessary trouble, which should surely be one of our aims.

Even though it may be some time yet before the generic names of agarics become settled, there is no reason why the same specific epithets should not be used for the same fungi, at least throughout the northern hemisphere. Difficulties likely to cause changes of name are:

(1) Purely nomenclatural troubles due to priority: e.g. *Agaricus* (*Lepiota*) *putidus* Weinmann, 1836, must take precedence over *A.* (*Tricholoma*) *putidus* Fr., 1838.

(2) Misquotations: far too many workers in the past have confidently copied author citations from other works without checking the originals, with the result that authors' names are wrongly applied, e.g. *Agaricus* (*Tricholoma*) *crassifolius* is frequently cited as 'Berk.' or '(Berk.) Fr.', whereas in fact there is no *A. crassifolius* in the works of Berkeley; but there is an *A. pachyphyllus* Berk., 1836, which Fries changed to *A. crassifolius* in 1874 in order not to duplicate his own *A.* (*Clitocybe*) *pachyphyllus* of 1838; there were no rules in 1874, but according to present-day Rules *A. pachyphyllus* Fr. is a later homonym of *A. pachyphyllus* Berk. and cannot be used; this seems reasonable enough to me since it helps to obviate confusion.

(3) Misdeterminations: these are much more difficult to deal with and must of necessity take longer to clear up. When one specific epithet has been used for two or more different fungi, in deciding which interpretation to accept as agreeing with the original, a worker must consult the type description, i.e. the earliest valid description after 1 January 1821; when such decisions are matters of opinion, there must inevitably be

discussion before all these matters can be finally settled and some may have to await monographical treatment of the genus to which the species belongs. There can be no doubt that sometimes Fries himself altered his concept of a particular epithet, and in this connexion it should be noted that some of the fungi illustrated in Fries's *Icones Selectae* (1867–84) are not those originally described by Fries under the same epithet. When Fries gave a varietal name to any of these, that is an indication that he thought them at least to some extent different and does not mean that the earlier specific epithet must of necessity be used for the later variety where the description of the variety differs clearly from that of the earlier species, e.g. *Agaricus* (*Naucoria*) *cidaris* var. *minor* Fr., 1884, which is quite convincingly *Phaeocollybia jennyae* (Karst.) Heim, but clearly differs in colour and stature from *A.* (*N.*) *cidaris* Fr., 1838, then *jennyae* is the correct epithet to use for the former fungus. For those fungi described by Lasch (1828–30) and Secretan (1833), treated in Fries's *Epicrisis*, 1838, the Lasch and Secretan descriptions must be consulted before these epithets are adopted.

(4) Validation: an unfortunate practice has been indulged in by most of us (myself included) in recent years, when giving a new name to a taxon described under an incorrect name, of not giving a Latin diagnosis where the description of the misidentification was not in Latin. According to the present Rules, this has resulted in a number of invalid names being in general use, and it should be our business to rectify this as quickly as possible. I have attempted this for those names of our agarics, which I have collected or studied, that need validation, assisted by Dr Hora (Part IV).

(5) Herbarium work: examination of herbarium material is an important part of agaricology, but owing to the different appearance of such material from fresh material it loses its value unless the dried material is accompanied by a good macroscopical description or adequate paintings and notes; when type material of older species is examined, care should be taken to ascertain whether the macroscopical features of the original description agree with those of any later-named species which may agree microscopically before equating the two; if possible fresh material of herbarium agarics should be obtained, preferably from the original locality, and examined macroscopically as well as microscopically before a verdict is pronounced on the dried material. If a new species of agaric is described from dried material accompanied only by a painting or coloured sketch this should be clearly stated in the diagnosis, since the resulting description might well be rather different from a full description made from abundant fresh material.

Varieties and forms have been excluded wherever possible and subspecies entirely so. As we do not yet know precisely what a species is in most genera of agarics (*Coprinus* is perhaps an exception), and even less what constitute infra-specific taxa, it seems to me quite wrong to describe numerous varieties and forms at the present time. Varieties and forms based on shape of the fruit body alone are to me quite valueless and an unnecessary encumbrance and difficulty in agaric taxonomy. Similarly, the use of subspecies can have no justification until complete data have accumulated for the group concerned. As a purely personal opinion I think there is still much work to be done at species level before thinking of further divisions.

These remarks are not made in a spirit of criticism of past work so much as in the hope that they may point the way to more careful work in the future and towards more order and less chaos in agaric nomenclature, a wish which I hope may find favour with workers of all nationalities.

It may surprise some readers that I should find it necessary to describe so many new species in this paper. I make no apology for this for three reasons: (1) the late A. A. Pearson often used to say that if one finds and makes a description of an agaric which does not agree convincingly with any species in the available literature, then it is one's duty to describe it as a new species; (2) this paper covers the results of about eight years' intensive collecting in many different parts of the country and different kinds of localities; (3) I believe that much good collecting in the past has been wasted because collectors believed that the material *must* have been described by Fries and was therefore fitted to a Friesian name without giving the original diagnosis critical attention. We must realize that although Fries undoubtedly described the agarics of certain types of locality very thoroughly for his own country, other types of locality were hardly touched by him, perhaps because he had not time or because they did not exist in Sweden or simply that he did not think them worth while. An example of this is alder and willow swamps, the agaric flora of which is quite prolific and contains a number of species apparently peculiar to it. Only a few of these can be found in the works of Fries, and I have found it necessary to describe a number of new species from such localities, continuing the work already started by others, in particular French authors.

All my spore measurements given in the text include the apiculus but exclude any ornament unless otherwise stated. In the family Rhodophyllaceae spores measured with the apiculus not visible or not including the length of the apiculus will frequently be 1 μ or 2 μ less in length.

Finally I wish to record my very grateful thanks to the Nuffield Foundation without whose grant for work on agarics during the last four years I should hardly have been able to achieve the working out of this list; to Dr R. W. G. Dennis and Mr D. A. Reid of The Herbarium, Kew, for much helpful advice and ready access to material, notes and books; and to the many friends in different parts of the country who have helped me in various ways with my work, in particular Mr E. A. Ellis of Wheatfen, Surlingham, Norfolk, Mr D. M. Henderson of The Royal Botanic Garden, Edinburgh, and Mr T. J. Wallace of Goodmans, Membury, Devon.

A. COMMENTS ON GENERA

The genera as used in the 'List'

Most of the generic names are used in accordance with already established practice, but the following comments and innovations may be noted.

White-spored agarics

Amanita is extended to include *Amanitopsis*, the virtual absence of a ring not being sufficiently diagnostic by itself to warrant separation of the latter.

Agaricus (*Armillaria*) *melleus* Vahl ex Fries, 1821, is retained in *Armillaria* Kummer, 1871 (Staude, 1857, is not accepted as a valid place of publication for this genus at present). Some authors, following Singer & A. H. Smith (1946), have indicated *Agaricus* (*Tricholoma*) *luteovirens* Alb. & Schw. ex Fr., 1821, as the type of *Armillaria* (Fr.) Quél., 1872, by applying the so-called 'residue' method of type selection to the species included by Quélet in *Armillaria*, and have followed Karsten in placing *Agaricus melleus* in *Armillariella* Karsten. This typification is not desirable since: (1) *luteovirens* was not included by Fries in *Agaricus* subgen. *Armillaria* in *Systema Mycologicum*, 1 (1821), but in *Agaricus* subgen. *Tricholoma* sect. *Genuina* (*International Code*, Art. 48, Stockholm, 1950, indicates that the name of a genus is validly published if reference to an effectively published subdiv. of a genus is included); (2) when Kummer first validly erected *Armillaria*, *luteovirens* was not included in it; (3) Locquin (1952) placed *luteovirens* in *Aspidella* Gilbert, now recognized as a synonym of *Amanita*, so that if *Armillaria* is typified by *luteovirens*, *Aspidella* becomes a synonym of *Armillaria* which in turn becomes a synonym of *Amanita*. We have therefore followed Clements & Shear (1931) and Donk (1949) in regarding *Agaricus melleus* as the type of *Armillaria*, with *Armillariella* Karst. as a synonym. This ensures that *Armillaria* is retained for a genus in a sense compatible with that of Fries's subgen. *Armillaria* of *Agaricus* as well as avoiding changing the name of a very well-known fungus. For further discussion see Dennis, Wakefield & Bisby (1954).

The pink-spored agarics included in *Agaricus* subgen. *Tricholoma* and *Clitocybe* by Fries are transferred to *Lepista* (which unfortunately antedates *Rhodopaxillus*) and *Rhodocybe*, respectively, except that *caelatum* and *truncatum* are transferred to *Rhodocybe* from *Tricholoma*. The small species of *Tricholoma* with cellular cap cuticle are segregated into *Dermoloma*, here used in its original sense (though used as a subgenus of *Tricholoma* by J. Lange), irrespective of the reaction of the spores to Melzer's reagent, since I do not think the iodine reaction is sufficiently diagnostic in this case for the separation of two such similar fungi as *T. cuneifolium* (spores amyloid) and *T. atrocinereum* (spores non-amyloid) into two different genera. Following Konrad & Maublanc (1948) the more robust species with basidia with carminophile granules formerly included in *Tricholoma* and *Clitocybe* are transferred to *Lyophyllum* (i.e. *L. decastes* = *Clitocybe decastes* = *T. aggregatum* and its allies and the dark-staining species, e.g. *T. immundum*, etc.); the smaller predominantly greyish fungi with carminophile granules are kept in *Collybia*, but in subgen. *Tephrophana* (which may, perhaps, be ultimately worth generic rank) and not transferred to *Lyophyllum* as done by Singer (1936) and others, since I do not think that possession of basidia of this type must necessarily mean generic affinity (once again, as for the iodine reaction of the spores, over-emphasis of one character, which may be satisfactorily diagnostic for one genus, but is not necessarily diagnostic for another, or even for another section of the same genus, is unsatisfactory).

Clitocybe is restricted to species with non-amyloid spores, those with amyloid spores formerly included having other diagnostic features to assist in their separation. Some species with cystidia formerly included in

Collybia or *Omphalia* are transferred to *Clitocybe* (e.g. *Collybia pseudoclusilis*) since their habit is more that of *Clitocybe* than *Omphalina* and in order to restrict *Omphalina* to a rather homogeneous group without cystidia.

Mycena is extended to include the small white agarics sometimes placed in *Delicatula*, and includes species with amyloid and non-amyloid spores which are clearly too closely related to be separated at generic level.

Collybia subgen. *Collybia* includes a number of species often placed in *Marasmius* because they revive on moistening after desiccation, many of which, however, were originally included by Fries in *Agaricus* subgen. *Collybia*; these differ from the species included in *Marasmius* in the 'List' in having a filamentous cap cuticle, no gelatinous layer in the flesh and in being relatively robust; *C. velutipes* is put in *Flammulina* Karsten, created by him for this species; *C. radicata* and *C. longipes* are put in *Oudemansiella* (which unfortunately has priority over the better-known *Mucidula*), the viscid character of the former species not being sufficient to warrant the separation of these otherwise rather similar fungi; for the present the predominantly grey species with basidia containing carminophile granules are kept in *Collybia* subgen. *Tephrophana*.

Marasmius is restricted to rather small fungi with various types of cap cuticle but always revivable after desiccation and often of insititious habit; a few with a gelatinous layer in the flesh and filamentous cap cuticle and frequently also with a disagreeable smell are placed in *Micromphale* (e.g. *M. perforans*, *M. foetidus*).

Omphalia was first validly taken up as a genus by S. F. Gray in 1821, but in the sense of Persoon, i.e. to include for the most part species of *Clitocybe*, see p. 172; also because there is *Omphalea* L., a genus of flowering plants, the name *Omphalina* replaces *Omphalia* and is used for the small species of the genus regarded as typical, e.g. *O. umbellifera* (= *Omphalina ericetorum*; those species with cystidia formerly included in *Omphalia* are now in *Mycena* or *Clitocybe* according to habit; *O. maura* is made the type species of the new genus *Myxomphalia* (see p. 453) formerly a section of *Mycena*.

Pleurotus is split up as indicated in Pearson & Dennis (1948), but *Hohenbuehelia* (which antedates the better-known *Acanthocystis*) is used for those *Acanthocystis* spp. with cystidia and *Resupinatus* for those without cystidia. Following Konrad & Maublanc (1948), I am using *Pleurotellus* for the small white or grey *Pleurotus* sp. without gelatinous flesh and with a white spore print.

The species of *Panus* and *Lentinus* with amyloid spores are transferred to *Panellus* and *Lentinellus*, respectively, since in each genus there is spore size and shape to support the amyloid reaction considered diagnostic for their separation.

Asterophora antedates *Nyctalis* and therefore replaces it.

Pink-spored agarics

Clitopilus is restricted to those species with spores longitudinally ribbed to varying degrees, but always at least slightly angular, (5)–6–12 angles when seen end-on *sub immers*. This genus, together with *Rhodotus*, *Lepista* and *Rhodocybe*, are placed in the family Clitopilaceae, corresponding more or less to the tribe Orcellées of Kühner (1946). Singer (1951) has included *Clitopilus* and *Rhodocybe* in the family Rhodophyllaceae, but this step seems premature and I prefer to restrict this family to those genera with spores clearly angular in side view, namely, *Entoloma*, *Leptonia*, *Nolanea*, *Eccilia* and *Claudopus*. These genera, as defined by Fries, are notoriously unsatisfactory but I have modified them only slightly, because I have not yet done sufficient field work to attempt a thorough revision, but I think they are worth maintaining for practical reasons. The classification of this family by Romagnesi under the single genus *Rhodophyllus* Quélet based on a detailed morphological study of spore shape does not seem to me sufficiently practical for general use and results in some anomalous groupings if applied strictly. For the present, therefore, *Entoloma* is more or less restricted to the larger species with fleshy fibrous stems, *Nolanea* to those with cap not usually expanding (i.e. mycenoid in habit) and silky-smooth but not scaly, *Eccilia* to those small species with distinctly decurrent gills resembling *Omphalina* in habit, and *Claudopus* to those with a rudimentary, excentric, lateral or absent stem; *Leptonia* remains for the time being rather heterogeneous, comprising all the slender-stemmed species with a scaly cap (but often only at the centre) and all those with blue or violaceous colours, irrespective of shape or scaliness, except for the larger fleshy stemmed species *dichroum*, *madidum*, *nitidum* and *porphyrophaeum*, which are retained in *Entoloma*; I hope to give a further account of this family in the future.

Brown-spored agarics

Those included in the 'List' in the family Cortinariaceae have not, in my opinion, been satisfactorily classified at generic level and I have therefore ventured to make a few innovations, and I expect that further changes will probably be necessary in the future. One of the reasons for this unsatisfactory state of affairs is that the smaller species (particularly in the genera *Cortinarius* and *Naucoria*) are still very imperfectly known in this country and, I suspect, also in Europe as a whole. The discovery by me of a number of apparently undescribed fungi in this group in recent years has clearly indicated to me that we still have much to learn about them. The small *Cortinarius* spp. await further treatment, but are readily recognizable as such, since the majority have an entirely fertile gill edge and in the few species with a sterile gill edge the cells are not distinctively shaped cystidia, such as are found in *Galerina* or *Naucoria*, but more or less clavate basidiiform cells.

The separation of the genera primarily on the colour of the spore print—*either* ochre or rusty *or* buff or snuff- or cigar-brown, i.e. the Friesian groups *Dermini* and *Phaeoti*—seems to be still the most useful and practical method, though a not entirely clear-cut distinction. Of the genera placed under this family in the 'List', Part IA (pp. 6–7), nos. 1, 2, 4–10 all have 'rusty' spores and 12–15 'snuff'-brown, only no. 11, *Pholiota*, includes fungi with spore prints of both colour groups. I have considered placing the snuff-brown-spored species of *Pholiota* (e.g. *myosotis*, *destruens*, *albocrenulata*) in other genera, leaving the rusty-spored ones (e.g. *squarrosa*) in *Pholiota*, but am not yet satisfied that this step is justified, especially as the rusty colour of the latter is often a deep sometimes almost chocolate-rusty. No. 3, *Leucocortinarius*, is white-spored, but seems to be otherwise so similar to *Cortinarius* subgen. *Phlegmacium* that it is best kept in this family (just as the continental *Hebelomina* is apparently a white-spored *Hebeloma* and would probably be placed in this family if it were found in Britain).

In the rusty-spored group my main problems have been: (1) whether to extend *Galerina* to include species with a germ pore in the spore; (2) whether to retain *Kuehneromyces* as a genus; and (3) the definition of *Phaeomarasmius*.

(1) Two fungi have been described in recent years which seem to show all characteristics of *Galerina* as emended by Kühner (1935) except that the spores have a germ pore. One of these, *Pholiota praticola* F. H. Møller, is quite common in Britain and difficult to distinguish macroscopically from *G. unicolor* (= *G. marginata*) except that it is found more often in mossy grass or soil and the cap is perhaps more greasy-viscid when moist; the germ pore is easily visible in most spores often without oil though not in all views (see Fig. 278). The other fungus, *Pholiotina funariophila* Moser, has not yet been found in Britain, but is described as having a filamentous cap cuticle, spores rusty in the mass and cap hygrophanous, but was placed in *Pholiotina* on account of the smooth spores with germ pore. *Pholiotina* is, however, characterized chiefly by the cellular cap cuticle combined with the germ pore feature. I do not think that the tramal and velar characters given by Singer and other authors for the separation of *Pholiotina* and *Conocybe* are sufficiently clear-cut to warrant their separation and have included the species of *Pholiotina* in *Conocybe* in the Check List. If truly a species of *Pholiotina*, *P. funariophila* should therefore become a species of *Conocybe*. But the clear-cut cap cuticle character (cellular or filamentous) is more suitable for separating these brown-spored agarics at generic level than the germ pore, which is sometimes small and difficult to see, especially when the spores are small (e.g. *C. laricina*). For this reason I prefer to restrict *Conocybe* (including *Pholiotina*) to species with cellular cuticle and spores with a germ pore, and to regard *P. funariophila* as a *Galerina* sp. having spores with a germ pore rather than *Conocybe* sp. with a filamentous cap cuticle. Furthermore, I suspect that careful examination of spores, perhaps at a higher magnification, of other *Galerina* spp. may disclose a germ pore, hitherto unsuspected because it is not visible under normal high magnification. Inspection of spores of one of my new species, *G. salicicola*, sub immers., revealed a quite distinct small germ pore not seen under lower magnification. I have therefore extended *Galerina* to include fungi having spores rough or smooth (e.g. *G. mycenopsis*) usually without visible germ pore but occasionally with one; the other diagnostic features are spore print ochre or rusty, cap of small or medium size (rarely more than 50 mm.) smooth and hygrophanous, cap cuticle filamentous and cystidia present at least on the gill edge.

(2) Singer & A. H. Smith (*Mycologia*, **38** (1946), 504) combined *Pholiota mutabilis* with a few other North American fungi in a new genus *Kuehneromyces*, chiefly on account of the germ pore in the spores. They

claimed that this feature, the colour of the spore print (given for *P. mutabilis* as 'between Verona Brown' and 'Cinnamon') and the vernal character of these fungi could be used to separate the genus. My experience of the spore print of *P. mutabilis* is that the colour varies with the depth of the deposit and moisture content from ochraceous-buff to chocolate-rusty, but is certainly not the dull colours of *Hebeloma* or *Inocybe*, for example. I think Fries correctly included *P. mutabilis* amongst the rusty-spored species, though the colour is certainly not so bright an ochre-rusty as in many *Galerina* spp., but rather the deep rusty of *P. squarrosa*. The vernal character does not apply to *P. mutabilis* in Britain; though it may often be one of the first to appear, it goes on fructifying throughout the season given suitable weather, and indeed, Singer later (1951) abandoned this character as diagnostic; other *Galerina* spp. are certainly equally vernal, e.g. *G. tibiicystis*, and many species growing on wood tend to appear early if conditions are suitable (e.g. *Pluteus* spp.). If *Kuehneromyces* is to be abandoned there are two alternatives: to keep *P. mutabilis* in *Pholiota* or to transfer it to the emended *Galerina*. Now one of the chief macroscopic characters of *P. mutabilis* is the hygrophanous cap, and since all *Galerina* spp. are hygrophanous but those of *Pholiota* are not, I have no hesitation in transferring *P. mutabilis* to *Galerina*. Kühner himself, in his outstanding work (*Galera*, (1935), p. 31, footnote 2), remarked 'cette espèce semble assez peu éloignée du *Ph. marginata*, mais les spores lisses à pore germinatif l'éloignent de tous les Galerinas que nous connaissons'. A comparison of *P. mutabilis*, *P. praticola* and *G. unicolor* in the field soon shows strong macroscopic resemblances between them, the coloured reflexed scales on the stem of *P. mutabilis* being the chief difference. Judging by the photographs given by Singer & A. H. Smith (l.c., 1946) some of the other North American species of *Kuehneromyces* resemble *G. unicolor* even more strongly.

(3) The original diagnosis of *Phaeomarasmius* Scherffel (1897) is 'Characteres generis *Marasmii*, sed sporis flavidis, ferrugineis' and the species included by him are four, three not known in Britain and a *P. excentricus* Scherffel. This species is stated to have the cap 'membranaceo, excentrico, radialiter striato-sulcato ferrugineo, tomentoso-floccoso, margine crenato pallido' and spores '12–16/7–8 μ, ferrugineis, s.l. melleis, ovalibus, saepe oblique apiculatis, laevibus'. The habitat is 'ad corticem unicae *Pyri communis* viventis'. Scherffel stated that he could not identify this fungus with any *Marasmius* described in Saccardo, but compared its habit with that of *M. menieri*. Quélet (1873) described *Naucoria horizontalis* as having the cap 'finement écailleux, silloné' and gives the spores as '15 μ, elliptiques'. For *N. horizontalis* Ricken (1873) describes the cap to be 'filzig-runzelig', the spores '14–18/6–7 μ, fast mandelformig' and the habitat 'in den Rissen der Rinde von Laubbäumen besonders an Äpfel- und Birnenstämmen' and quotes *Agaricus rimulincola* Rabenh. as a synonym. There can thus be no doubt that *P. excentricus* Scherffel is the same as *N. horizontalis* s. Quélet and Ricken.

Reference to the original plate and diagnosis of Bulliard and to all the descriptions of Fries of *horizontalis*, however, reveals that the cap was described originally as well as subsequently as 'laevi' and the habitat given as bark of various trees, *Ulmus*, *Pinus*, *Pyrus*, etc. Rabenhorst (1851) described *A.* (*N.*) *rimulincola* as a new species with cap 'gefaltet, runzelig-filzig' growing 'in den Rissen der Rinde älterer Bäume'. In Rabenhorst's *Kryptogamenflora*, **1** (1884), 676, Winter included *horizontalis* and *rimulincola* next to one another in his sect. *Gymnoti* of *Agaricus* subgen. *Naucoria*, *horizontalis* with cap 'glatt' and *rimulincola* with cap 'filzig-runzelig'. Saccardo (1887) and British authors did likewise, Rea (1922) giving spore measurements for *horizontalis* as '6–8/5–6 μ, broadly elliptic, punctate'. Kühner (*Galera*, 1935, p. 33) states that *N. erinacea* and *N. horizontalis* 'à leur revêtement piléique tomenteux ou pelucheux' belong to *Phaeomarasmius* and that *A. rimulincola* is a synonym of *N. horizontalis* (thus taken in the sense of Quélet), but also mentions that he thinks *horizontalis* s. Rea to be different.

It follows, then, that there are two fungi of similar excentric-stemmed habit and habitat on bark:

N. horizontalis (Bull. ex Fr.) Quél. s. Bulliard, Fries, Rabenhorst, Saccardo, Rea, with smooth cap and on the evidence of Rea and myself (see below) spores less than 10 μ long: and *N. rimulincola* (Rabenh.) Sacc. (= *N. horizontalis* (Bull. ex Fr.) Quél. s. Quélet, Ricken, Kühner, Singer, Moser non Fries, etc.) with tomentose-wrinkled cap and spores 12 μ or more long, which is also described by Scherffel as *P. excentricus*.

I have collected both these fungi and found the spores of the former (one collection only) to be 6–7½/4–5 μ, ellipsoid narrower at one end, and smooth, and I think it to be the same as *N. horizontalis* s. Rea, despite slight difference in spore size and the fact that Rea says that they are punctate.

Singer (1951) adopted *Phaeomarasmius* in an extended sense to include not only Scherffel's fungus (erroneously named *horizontalis* by Singer) and *Pholiota erinacea* but also many species of sect. *Lepidoti* of *Agaricus* subgen. *Naucoria* Fries. I do not think this is satisfactory, since the very fragile central-stemmed species such as *N. carpophila* seem very far removed from the relatively tough, 'reviving', excentric-stemmed *N. horizontalis* and *N. rimulincola*. I have therefore restricted *Phaeomarasmius* to these two 'reviving' species and *Pholiota erinacea*, which, as I have confirmed on fresh material, can be revived after desiccation; with these three species in it the genus corresponds more closely to Scherffel's diagnosis.

I consider *Naucoria* subgen. *Flocculari*a Kühner & Romagnesi described without Latin diagnosis (1953) worthy of generic rank to include the species placed by these authors therein and by Singer in *Phaeomarasmius*. Unfortunately the name *Flocculari*a has already been used for a genus (Pouzar, *Čes. Mykol.* **11** (1957), 49, Amanitaceae) so I propose *Flocculina*.

Flocculina gen.nov.

Pileus siccus, floccoso- vel granuloso-squamulosus vel farinaceus vel squamis parvis ± erectis acutis fibrillosis obtectus, haud raro jove pluvio exstriatus; cellulae squamarum pilei globosae, pyriformes, clavatae, breviter ellipsoideae vel curvatae, interdum late cylindricae (e.g. F. limulata), tunicis incrustato-pigmentatis vel ± coloratis; stipes vulgo squamulis eis pilei similibus praecipue prope apicem obtectus; sporae in cumulo ochraceae vel ferrugineae, laeves, diversiformes, vulgo $< 10\,\mu$ longae, tunicis aut coloratis aut tenuibus et fere hyalinis; cystidia aciei lamellarum diversiformia: cystidia faciei lamellarum nulla: vulgo ad lignum vel ad detritum plantarum, rariore ad terram. Typus generis Naucoria granulosa J. Lange.

Cap dry, floccose- or granular-scaly or mealy or with ± erect pointed fibrillose scales, commonly not striate when moist; cells of scales on cap spherical to clavate, pyriform, shortly ellipsoid or sausage-shaped, in a few species broadly cylindrical (e.g. *F. limulata*), walls encrusted pigmented or more or less coloured sub micr.; stem often with similar scales at least near apex; spores ochre or rusty in mass, smooth, variously shaped, frequently $< 10\,\mu$ long, walls coloured or rather thin and almost colourless sub micr.; marginal cystidia present, variously shaped; facial cystidia absent; frequently on wood or other plant debris, a few species on soil.

For key to species see p. 232.

In the snuff-brown group the problem is what to do with *Naucoria*. Those species with rusty spores included by Fries in *Naucoria* are transferred to *Galerina*, *Flocculina*, *Phaeomarasmius* or *Phaeocollybia*. I have followed Singer in placing *N. cucumis* in *Macrocystidia* in the white-spored series next to *Flammulina velutipes*, to which it seems to have more resemblances than any other agaric, especially in its sometimes very pale spore print. Those species with a strictly cellular cap cuticle *and* spores with distinct germ pore are transferred to *Agrocybe* (e.g. *N. arvalis*). For the remaining species, the questions are which species to select as the type and whether to separate *Alnicola* from this residue. Singer (1936) and later Singer & A. H. Smith (1946) chose *N. centunculus* for the type species of *Naucoria* (Fr.) Quélet. Since, however, *Naucoria* was first validated as a genus by Kummer (1871) and not by Quélet (1872), and since this species is not one of Fries's sect. *Genuini* (nos. 1–7) of *Agaricus* subgen. *Naucoria* in *Systema Mycologicum*, 1 (1821), it should be rejected, as shown by Donk (1949). The first author to divide *Naucoria* into separate genera was Karsten (1879) who retained the name *Naucoria* for Fries's sect. *Lepidoti*, 1838, which corresponded to his earlier sect. *Genuini*. For the bulk of the remainder of *Naucoria* (sect. *Gymnoti* and *Phaeoti*, 1838) Karsten created the genus *Simocybe*.

Of the seven original species of *Naucoria* sect. *Genuini*, Karsten placed one (*furfuraceus*) in *Tubaria*, omitted one (*graminicola*), and retained the remaining five in *Naucoria*. Of these, *conspersus* is now regarded as a *Tubaria* while *pannosus* and *segestrius* are relatively unknown. This leaves a choice between *escharoides* and *siparius*. As *escharoides* is the better known of the two, Donk (1949) proposed this species for the type of *Naucoria*, with which I am in agreement and therefore accept, despite the fact that this reduces *Alnicola* to a synonym of *Naucoria*; furthermore, *escharoides* is included by Kummer in his genus *Naucoria*. As Singer & A. H. Smith (1946) proposed *centunculus* as the type species of *Simocybe*, the latter also became a synonym of *Naucoria* emend. Singer 1936. I do not propose to maintain *Simocybe* since I am retaining *centunculus* together with *laevigata* and *rubi* (and *reducta* should it be found in Britain) in *Naucoria* besides species included recently in *Alnicola* (e.g. *N. escharoides*). I do not think the differences between *Alnicola* and *Naucoria* emend. Singer, 1936, are sufficiently distinct to warrant their separation. This is because I have found four fungi which combine characters of both these genera; that is to say they have a snuff-brown spore print, hygrophanous cap and are of small stature, but the cap cuticle consists, at least in part, of rather broad short cells (as in some Alnicolas) but with completely smooth spores (as in *Naucoria* emend. Singer). I do not think the olivaceous colours of *N. centunculus* and *N. rubi* are diagnostic, since *N. laevigata*, as recently brought to me from Norfolk, was only very slightly olivaceous and was originally described as not being olivaceous at all. Furthermore, I have found another puzzling fungus in the Shetland Islands with the cap cuticle of an *Alnicola* (i.e. some cells short and broad) but spores with a distinct germ pore. If I place this species in *Agrocybe* then the cap cuticle character for that genus is no longer diagnostic since all those species included in *Agrocybe* in recent years have a strictly cellular cuticle. I prefer to restrict *Agrocybe* to species which *combine this character* with a distinct germ pore in the spores and to emend *Naucoria* to include species with spores smooth or rough and without or exceptionally with a distinct germ pore.

Thus emended *Naucoria* may be briefly diagnosed as follows: spores snuff- or cigar-brown in mass; cap usually small, hygrophanous; veil present or absent; spores rough or less commonly smooth sub immers., rarely with a distinct germ pore (and then cap cuticle not strictly cellular); cap cuticle either strictly cellular or heterocellular, never entirely filamentous of narrow hyphae $< 10\,\mu$ diam.; marginal cystidia present; facial cystidia in all species so far known absent; mostly on soil or in *Sphagnum*, especially common in wet places, but some on burnt ground or on wood or other plant debris. Though I am well aware that it is unwise to assume that any one character will have equal significance in different genera, there is thus a parallel between *Naucoria* and *Galerina* as emended by me in so far as spore characters are concerned.

Black or purplish brown spored agarics

As *Psathyra* is antedated and therefore invalid, *Psathyrella* is used for the large number of species with cellular cuticle and smooth spores formerly included in *Stropharia* (e.g. *caput-medusae*), *Psilocybe* (e.g. *sarcocephala*), *Hypholoma* (e.g. *hydrophila*), *Psathyra* and *Psathyrella*. *Drosophila* cannot be used for this group since it is obligatory to maintain one of the Friesian subgenera of *Agaricus* listed above as a genus for this purpose. For the same reason *Naematoloma* cannot be accepted for *Hypholoma* s. stricto, i.e. for the brightly coloured species such as *sublateritium* and *fasciculare*, but also including *uda* and *ericaea* from *Psilocybe*. *Stropharia* is restricted to the more or less viscid species such as *semiglobata* and *squamosa*.

Boletes

Tylopilus is retained as a separate genus on account of the spores being flesh-pink in the mass, otherwise no change from Pearson & Dennis (1948) is made. Although I have not studied the Boletes in full anatomical detail, I prefer not to accept *Suillus*, *Xerocomus*, *Leccinum*, *Phlebopus* or *Pulveroboletus* for the present, since *B. rubinus* seems to be intermediate between *Suillus* and *Xerocomus* and the distinction between these two does not seem to me always to be clear-cut. *Leccinum* is perhaps more worthy of generic rank but if I were to accept this then I should feel it necessary to alter the definition of some of the others, perhaps combining *Suillus* and *Xerocomus*, but I have not sufficient knowledge of this group to undertake this task at the moment.

B. SUMMARY OF REDISPOSITION OF THE GENERA OF PEARSON & DENNIS (1948) AND THEIR SUBDIVISIONS

('No change' refers to the majority of species, the occasional species removed for some reason or other is not mentioned, nor are additions to the list taken into account.)

Amanita	Includes *Amanitopsis*
Amanitopsis	Included in *Amanita*
Anellaria	Included in *Panaeolus*
Bolbitius	No change
Boletinus	No change
Boletus	*felleus* removed to *Tylopilus*
Cantharellus	Restricted to the larger species (e.g. *cibarius*); *cupulatus* removed to *Omphalina*
Claudopus	No change
Clitocybe	Sect. Aspropaxillus and sect. Leucopaxillus form *Leucopaxillus*; sect. Cantharellula forms gen. *Cantharellula*; sect. Rhodopaxillus to *Rhodocybe*; sect. Hygrophoropsis forms gen. *Hygrophoropsis*
Clitopilus	No change
Collybia	Two subgenera; sect. Tephrophanae becomes subgen. TEPHROPHANA, the remainder subgen. COLLYBIA, which includes most of *Marasmius* sect. Collybioides; sect. Oudemansiella and sect. Xerula form *Oudemansiella*; *velutipes* removed to *Flammulina*
Coprinus	Includes *Psathyrella* sect. Pseudocoprinus
Cortinarius	Subgenera changed, except TELAMONIA and HYDROCYBE, not yet dealt with
Craterellus	No change
Crepidotus	Loses sect. Phyllotopsis to that genus
Eccilia	No change
Entoloma	Loses the slender blue-tinged species, *griseocyaneum*, *ardosiacum* (as *mougeotii*) to *Leptonia*, and *sericeum* to *Nolanea*
Flammula	Later homonym; sect. Lubricae and sect. Subsiccae (except *decipiens*) to *Pholiota*, and sect. Fulvidula and *decipiens* to *Gymnopilus*
Galera	Later homonym; sect. Conocybe becomes part of *Conocybe*, sect. Galerina part of *Galerina*
Gomphidius	No change
Gyrodon	No change
Gyroporus	No change
Hebeloma	Includes *Pholiota radicosa*
Hygrophorus	Sect. Adnati transferred from subgen. CAMAROPHYLLUS to subgen. HYGROCYBE; *micaceus* and *foetens* to subgen. CAMAROPHYLLUS

Hypholoma	Includes *Psilocybe*, sect. Hypholoma; sect. Drosophila becomes part of *Psathyrella*; sect. Lacrimaria forms genus *Lacrimaria*
Inocybe	Two subgenera (1) INOCYBE corresponding to Levisporae, and (2) CLYPEUS for Nodulisporae and Verrucosisporae
Laccaria	No change
Lactarius	No change
Lentinus	Loses sect. Lentinellus to that genus
Lepiota	Loses sect. Limacella to that genus, Lepiotella to *Drosella* (prior name), Granulosae to *Cystoderma*, Anomalae to *Melanophyllum*, Leucobolbitius to *Leucocoprinus* emend. Singer
Leptonia	Includes all bluish species of *Entoloma* and *Nolanea* except *E. dichroum*, *E. madidum* and *E. nitidum*, and includes also the scaly-capped *Nolanea* spp.
Leptotus	No change
Marasmius	Loses most of sect. Collybioides to *Collybia* (*Collybia*); sect. Xeromphalina to *Xeromphalina*
Mycena	Includes *Omphalia*, sect. Graciles-Albidae and sect. Delicatula: also *rosella* and *belliae* from *Omphalia*, sect. Pyxidatae, and *fibula* and *camptophylla* from sect. Graciles-Reliquae.
Naucoria	Restricted to sect. Alnicola with *centunculus* and *effugiens* (= *rubi*) from Eu-Naucoria; sect. Phaeocollybia becomes that genus; Macrocystis becomes *Macrocystidia*; sect. Galerina becomes part of *Galerina*; Phaeomarasmius forms that genus; *cerodes* (not known) is excluded from sect. Eu-Naucoria, *horizontalis* is in *Phaeomarasmius*, *myosotis* in *Pholiota*, *temulenta* in *Agrocybe* and *carpophila* and *siparia* in *Flocculina*
Neurophyllum	Replaced by *Gomphus* (has priority)
Nolanea	Loses the bluish species *exilis* and *coelestina* and the scaly-capped species *babingtonii*, *fulvostrigosa* and *fumosella* to *Leptonia*
Nyctalis	Replaced by *Asterophora* (has priority)
Omphalia	As first validated by S. F. Gray, 1821, is a synonym of *Russula* and is abandoned in favour of *Omphalina*: *hydrogramma*, *umbilicata*, *leucophylla* transferred to *Clitocybe*, *atropuncta* to *Hygrophorus* (Camarophyllus), *maura* to *Myxomphalia*, *rosella*, *belliae*, sect. Graciles-Albidae, *fibula*, *camptophylla* and sect. Delicatula to *Mycena*; sect. Xeromphalina to *Xeromphalina*
Panaeolus	Includes *Anellaria*
Panus	Loses sect. Panellus to that genus
Paxillus	No change
Pholiota	Loses sect. Phaeolepiota to that genus; sect. Rozites to that genus; sect. Hebeloma to that genus; sect. Naucoria-Phaeomarasmius to *Phaeomarasmius*; sect. Agrocybe, sect. Conocybe and sect. Galerina become parts of those

	genera, respectively; from sect. Eu-Pholiota, *spectabilis* is transferred to *Gymnopilus* (as *G. junonius*; has priority), *mutabilis* to *Galerina, terrigena* to *Inocybe* (Inocybe); extended to include *Flammula*, sect. Lubricae and sect. Subsiccae except *decipiens*
Phylloporus	No change
Pleurotus	Loses sect. Acanthocystis (a) to *Hohenbuehelia* except *serotinus* to *Panellus*; Acanthocystis (b) to *Resupinatus* except *laurocerasi* to *Lentinellus*: sect. Pleurotellus to that genus: sect. Panellus becomes part of that genus: sect. Rhodotus becomes that genus: *porrigens* transferred to *Pleurotellus* and *mutilus* to *Omphalina*
Plicatura	No change
Pluteus	No change
Porphyrellus	No change
Psalliota	Replaced by *Agaricus*
Psathyra	Later homonym, transferred to *Psathyrella*
Psathyrella	Loses sect. Pseudocoprinus to *Coprinus*; includes *Stropharia* sect. Hypholomoideae and sect. Psathyroideae, *Hypholoma* sect. Drosophila, *Psilocybe* sect. Drosophila, and *Psathyra*
Psilocybe	Restricted to sect. Anomali plus *cyanescens*; loses sect. Drosophila to *Psathyrella*, sect. Hypholoma to *Hypholoma*; sect. Deconica except *cyanescens* to *Deconica*; sect. Panaeolina becomes genus *Panaeolina*
Ripartites	No change
Russula	No change
Schizophyllum	No change
Strobilomyces	No change
Stropharia	Loses sect. Hypholomoideae, sect. Psathyroideae and *hypsipus* s. J. Lange to *Psathyrella*
Tricholoma	Sect. Fumosa becomes *Lyophyllum*; *bulbigerum* transferred to *Leucocortinarius*; sect. Dermoloma becomes *Dermoloma*; sect. Melanoleuca becomes *Melanoleuca*; sect. Rhodopaxillus becomes *Lepista* (has priority); sect. Rhodocybe becomes part of *Rhodocybe*
Tubaria	Loses sect. Galerina to that genus: *crobulus* and *inquilina* transferred to *Deconica*
Volvaria	Antedated and replaced by *Volvariella*

C. ALPHABETICAL LIST OF NEW NAMES OR COMBINATIONS PROPOSED (EXCLUDING NEW SPECIES)

Agaricus devoniensis nom.nov.

Psalliota arenicola Wakef. & Pearson, *Trans. Brit. mycol. Soc.* **29** (1946), 205, non *A.* (Naucoria) *arenicola* Berk., *Hooker's J. Bot., Lond.*, **2** (1843), 511, nec *A.* (Omphalia) *arenicola* (Fr.) Fr., *Hymenomycetes Europaei* (1874), 159 (= *A.* (O.) *retosta* * *A. arenicola, Fr. Icones Selectae Hymenomycetum* (1867), 78).

Agaricus gennadii (Chatin & Boud.) comb.nov.
Chitonia gennadii Chatin & Boud., *J. Bot., Paris*, **12** (1898), 66. = *Clarkeinda cellaris* Bres., *Ann. Mycol., Berl.*, **3** (1905), 162.

Agaricus porphyrizon nom.nov.
A. purpurascens (Cooke) Pilát, *Acta Mus. nat. Prag.* **7** B (1951), 23. (= *A. arvensis* var. *purpurascens* Cooke, *Handbook of British Fungi*, ed. 2 (1883–91), 193), non *A. purpurascens* Fr. ex Secr., *Mycographie Suisse*, I (1833), 157.

Agrocybe attenuata (Kühn.) comb.nov.
A. firma var. *attenuata* Kühn., *Schweiz. Z. Pilzk.* **31** (1953), 150.

Agrocybe dura var. **xanthophylla** (Bres.) comb.nov.
Pholiota dura var. *xanthophylla* Bres., *Fungi Tridentini*, II (1898), 52.

Agrocybe temulenta (Fr.) comb.nov.
Agaricus (Naucoria) *temulentus* Fr., *Syst. Mycol.* I (1821), 268.

Cantharellula expallens (Pers. ex Fr.) comb.nov.
Agaricus (Omphalia) *expallens* Pers. ex Fr., *Syst. Mycol.* I (1821), 172.

Clitocybe barbularum (Romagn.) comb.nov.
Omphalia barbularum Romagn., *Rev. mycol., Paris*, **17** (1952), 44.

Clitocybe depauperata (J. Lange) comb.nov.
C. fragrans var. *depauperata*, J. Lange, *Dansk. bot. Ark.* **6**, no. 5 (1930), 56.

Clitocybe incomis (Karst.) comb.nov.
Collybia incomis Karst., *Hattsvampar*, I (1879), 164.

Clitocybe luffii (Massee) comb.nov.
Omphalia luffii Massee, *Trans. Brit. mycol. Soc.* **1** (1897), 21.

Clitocybe pseudoclusilis (Joss. & Konrad) comb.nov.
Collybia pseudoclusilis Joss. & Konrad, *Bull. Soc. linn. Lyon*, **10** (1931), 21.

Clitocybe scyphoides (Fr.) comb.nov.
Agaricus (Omphalia) *scyphoides* Fr., *Syst. Mycol.* I (1821), 163.

Clitocybe striatula (Kühn.) comb.nov.
Rhodocybe striatula Kühn., *Bull. Soc. linn. Lyon*, **7** (1928), 139.

Clitopilus hobsonii (Berk.) comb.nov.
Agaricus (Pleurotus) *hobsonii* Berk., *Outlines of British Fungi* (1860), 138.

Collybia (Tephrophana) **carbonaria** (Vel.) comb.nov.
Omphalia carbonaria Vel., *Česke Houby* (1920), 288.

Collybia (Collybia) **oreadoides** (Pass.) comb.nov.
Marasmius oreadoides Pass., *Nuovo G. bot. ital.* **4** (1872), 109.

Collybia (Tephrophana) **putidella** nom.nov.
Agaricus (Tricholoma) *putidus* Fr., *Epicrisis* (1838), 54, non *A.* (*Lepiota*) *putidus* Weinm., *Hymenomycetes Rossicae* (1836), 12.

Collybia (Tephrophana) **striaepilea** (Fr.) comb.nov.
Agaricus (Omphalia) *striaepilea* Fr., *Öfvers. VetenskAkad. Förh. Stockh.* **18** (1861), 22.

Cortinarius (Phlegmacium) **subclaricolor** (Moser) comb.nov.
Phlegmacium subclaricolor Moser apud Gams, *Kleine Kryptogamenflora von Mitteleuropa*, II (1953), 181 (regarded as valid, since Bresadola's description of *C. claricolor* is in Latin).

Deconica montana (Pers. ex Fr.) comb.nov.
Agaricus (Psilocybe) *montanus* Pers. ex Fr., *Syst. Mycol.* I (1821), 293.

Dermoloma atrocinereum (Pers. ex Pers.) comb.nov.
Agaricus atrocinereus Pers. ex Pers., *Mycol. Europ.* III (1828), 213.

Eccilia sericeonitida nom.nov.
Agaricus (Clitopilus) *undatus* Fr., *Epicrisis* (1838), p. 149, non *A.* (*Collybia*) *undatus* Berk., *English Flora*, V (*Cryptogamia*), Part II (1836), 51.

Entoloma sordidulum (Kühn. & Romagn.) comb.nov.
Rhodophyllus sordidulus Kühn. & Romagn., *Rev. Mycol., Paris*, **19** (1954), 10.

Flocculina carpophila (Fr. ex Fr.) comb.nov.
Agaricus (Naucoria) *carpophilus* Fr. ex Fr., *Epicrisis* (1838), 202.

Flocculina carpophiloides (Kühn.) comb.nov.
Naucoria carpophiloides Kühn., *Bull. Soc. Nat. Oyonnax*, **10–11** (1957), Suppl., 5.

Flocculina erinaceella (Peck) comb.nov.
Agaricus (Pholiota) *erinaceellus* Peck, *Rep. N.Y. St. Mus.* **31** (1878), 70.

Flocculina ferruginea (R. Maire) comb.nov.
Naucoria ferruginea R. Maire apud Kühn., *Bull. Soc. Nat. Oyonnax*, **10–11** (1957), Suppl., 5.

Flocculina granulosa (J. Lange) comb.nov.
Naucoria granulosa J. Lange, *Flora Agaricina Danica*, V (1940), p. vi.

Flocculina limulata (Fr. ex Weinm.) comb.nov.
Agaricus (Flammula) *limulatus* Fr. ex Weinm., *Hymenomycetes Rossicae*, (1836), 201.

Flocculina muricata (Fr. ex Fr.) comb.nov.
Agaricus (Pholiota) *muricatus* Fr. ex Fr., *Syst. Mycol.* I (1821), 244.

Flocculina rhombospora (Atk.) comb.nov.
Lepiota rhombospora Atk., *Proc. Amer. phil. Soc.* **57** (1918), 356.

Flocculina saliciphila (Favre) comb.nov.
Naucoria saliciphila Favre, *Les champignons supérieures des Associations fongiques des Hauts Marais Jurassiens* (1948), 214.

Flocculina siparia (Fr.) comb.nov.
Agaricus (Naucoria) *siparius* Fr., *Syst. Mycol.* 1 (1821), 261.

Flocculina subincarnata (Joss. & Kühn.) comb.nov.
Naucoria subincarnata Joss. & Kühn., *Bull. Soc. Nat. Oyonnax*, **10–11** (1957), Suppl., 6.

Galerina embolus (Fr.) comb.nov.
Agaricus (Galera) *embolus* Fr., *Epicrisis* (1838), 206.

Galerina mutabilis (Schaeff. ex Fr.) comb.nov.
Agaricus (Pholiota) *mutabilis* Schaeff. ex Fr., *Syst. Mycol.* 1 (1821), 245.

Galerina praticola (F. H. Møller) comb.nov.
Pholiota praticola F. H. Møller, *Fungi Faeroes*, 1 (1945), 231.

Galerina pseudopumila nom.nov.
Agaricus (Pholiota) *pumilus* Fr., *Elenchus Fungorum*, 1 (1828), 29; non *A.* (Naucoria) *pumilus* Pers. ex Fr., *Syst. Mycol.* 1 (1821), 265.

Gymnopilus decipiens (W. G. Smith) comb.nov.
Agaricus (Flammula) *decipiens* W. G. Smith, *J. Bot., Lond.*, **7** (1869), 269.

Gymnopilus junonius (Fr.) comb.nov.
Agaricus (Pholiota) *junonius* Fr., *Syst. Mycol.* 1 (1821), 244.

Hohenbuehelia rickenii (Kühn.) comb.nov.
Geopetalum rickenii Kühn., *Bull. Soc. Nat. Oyonnax*, **8** (1954), 74 (the combination *H. rickenii* proposed by Kühner in the same paper, l.c., 75, is not valid according to the Rules).

Hygrophorus (Hygrocybe) **aurantiosplendens** (Haller) comb.nov.
Hygrocybe aurantiosplendens Haller, *Schweiz. Z. Pilzk.* **32** (1954), 89.

Hygrophorus (Hygrocybe) **brevispora** (F. H. Møller) comb.nov.
Hygrocybe brevispora F. H. Møller, *Fungi Faeroes*, 1 (1945), 142.

Hygrophorus (Hygrocybe) **glutinipes** (J. Lange) comb.nov.
Hygrocybe glutinipes (J. Lange) Haller, *Schweiz. Z. Pilzk.* **34** (1956), 179 (= *Hygrocybe citrina* var. *glutinipes* J. Lange, *Flora Agarcina Danica*, v (1940), p. iv).

Hygrophorus (Hygrocybe) **konradii** (Haller) comb.nov.
Hygrocybe konradii Haller, *Schweiz. Z. Pilzk.* **33** (1955), 172.

Hygrophorus (Hygrocybe) **subminutulus** (Murrill) comb.nov.
Hygrocybe subminutula Murrill, *Bull. Torrey bot. Cl.* **67** (1940), 233, sub nom.gen. *Hydrocybe.*

Hypholoma laeticolor (F. H. Møller) comb.nov.
Naematoloma laeticolor F. H. Møller, *Fungi Faeroes*, 1 (1945), 192.

Inocybe (Inocybe) **agardhii** (N. Lund) comb.nov.
Agaricus (Flammula) *agardhii* N. Lund., *Conspectus Hymenomycetum circa Holmiam crescentium* (1846), 40.

Inocybe (Inocybe) **brunneo-atra** (Heim) comb.nov.
I. descissa var. *brunneo-atra*, Heim, *Inocybe. Encycl. mycol.* (1931), 234.

Laccaria bicolor (R. Maire) comb.nov.
L. laccata var. *bicolor* R. Maire, *Publ. Inst. bot. Barcelona*, **3** (1937), 84.

Lentinellus flabelliformis (Bolt. ex Fr.) comb.nov.
Agaricus (Pleurotus) *flabelliformis* Bolt. ex Fr., *Syst. Mycol.* 1 (1821), 185.

Lentinellus laurocerasi (Berk. & Br.) comb.nov.
Agaricus (Pleurotus) *laurocerasi* Berk. & Br., *Ann. Mag. nat. Hist.*, Ser. 5, **7** (1881), 126.

Lepiota leucothites (Vitt.) comb.nov.
Agaricus leucothites Vitt., *Funghi Mangerecci* (1835), 310.

Lepista saeva (Fr.) comb.nov.
Tricholoma saevum (Fr.) Gillet, *Les Hymenomycetes* (1874), 123 (= *Agaricus* (Tricholoma) *personatus* * *A. saevus* Fr., *Epicrisis* (1838), 48).

Leptonia babingtonii (Blox.) comb.nov.
Agaricus (Nolanea) *babingtonii* Blox. apud Berk. & Br., *Ann. Mag. nat. Hist.*, Ser. 2, **13** (1854), 399.

Leptonia caesiocincta (Kühn.) comb.nov.
Rhodophyllus caesiocinctus Kühn., *Rev. Mycol., Paris*, **19** (1954), 4.

Leptonia coelestina (Fr.) comb.nov.
Agaricus (Nolanea) *coelestinus* Fr., *Epicrisis* (1838), 158.

Leptonia corvina (Kühn.) comb.nov.
Rhodophyllus corvinus Kühn., *Rev. Mycol., Paris*, **19** (1954), 4.

Leptonia exilis (Fr. ex Fr.) comb.nov.
Agaricus (Nolanea) *exilis* Fr. ex Fr., *Syst. Mycol.* 1 (1821), 206.

Leptonia fulvostrigosa (Berk. & Br.) comb.nov.
Agaricus (Nolanea) *fulvostrigosa* Berk. & Br., *Ann. Mag. nat. Hist.*, Ser. 5, **1** (1878), 19.

Leptonia griseocyanea (Fr. ex Fr.) comb.nov.
Agaricus (Leptonia) *griseocyaneus* Fr. ex Fr., *Syst. Mycol.* 1 (1821), 202.

Leptonia griseorubella (Lasch) comb.nov.
Agaricus griseorubellus Lasch, *Linnaea*, **4** (1829), 542.

Leptonia induta (Boud.) comb.nov.
Entoloma indutum Boud., *Bull. Soc. mycol. Fr.* **16** (1900), 194.

Leptonia leptonipes (Kühn. & Romagn.) comb.nov.
Rhodophyllus leptonipes Kühn. & Romagn., *Rev. Mycol., Paris*, **19** (1954), 6.

Leptonia lividocyanula (Kühn.) comb.nov.
Rhodophyllus lividocyanulus Kühn., *Rev. Mycol., Paris*, **19** (1954), 37 (regarded as valid since Bresadola's description of *Eccilia griseorubella* is in Latin).

Leptonia majuscula (Kühn. & Romagn.) comb.nov.
Rhodophyllus majusculus Kühn. & Romagn., *Rev. Mycol., Paris*, **19** (1954), 6.

Leptonia mougeotii (Fr.) comb.nov.
Eccilia mougeotii Fr. apud Quél., *Les Champignons du Jura et Vosges*, II (1873), 333.

Leptonia polita (Pers. ex Fr.) comb.nov.
Agaricus (Eccilia) *politus* Pers. ex Fr., *Syst. Mycol.* I (1821), 209.

Leptonia pulverea (Rea) comb.nov.
Entoloma pulvereum Rea, *Trans. Brit. mycol. Soc.* **2** (1907), 170.

Leptonia sericeoides (J. Lange) comb.nov.
Rhodophyllus sericeoides J. Lange, *Flora Agaricina Danica*, V (1940), p. viii.

Leptonia strigosissima (Rea) comb.nov.
Nolanea strigosissima Rea, *Trans. Brit. mycol. Soc.* **6** (1920), 325.

Lyophyllum fumosum (Pers. ex Fr.) comb.nov.
Agaricus (Clitocybe) *fumosus* Pers. ex Fr., *Syst. Mycol.* I (1821), 88.

Micromphale brassicolens (Romagn.) comb.nov.
Marasmius brassicolens Romagn., *Bull. Soc. mycol. Fr.* **68** (1952), 139.

Micromphale impudicum (Fr.) comb.nov.
Marasmius impudicus Fr., *Epicrisis* (1838), 377.

Mycena belliae (Johnston) comb.nov.
Agaricus (Omphalia) *belliae* Johnston apud Berk., *Ann. Mag. nat. Hist.*, Ser. I, **6** (1841), 356.

Mycena carnicolor nom.nov.
Omphalia rosella J. Lange, *Dansk bot. Ark.* **6**, No. 5 (1930), 14, non *O. rosella* [Batsch] S. F. Gray, *Natural Arrangement of British Plants*, I (1821), 613, nec *Mycena rosella* (Fr.) Kummer, *Der Führer in die Pilzkunde* (1871), 109.

Mycena cyphelloides nom.nov.
Omphalia gibba [Alb. & Schw.] Pat., *Tabulae Analyticae fungorum*, 2nd series (1886), 26 (no. 560), non *O. gibba* [Pers.] S. F. Gray, *Natural Arrangement of British Plants*, I (1821), 612, nec *Helotium gibbum* Alb. & Schw., *Conspectus Fungorum* (1805), 350.

Nolanea canosericea (J. Lange) comb.nov.
Rhodophyllus canosericeus J. Lange, *Flora Agaricina Danica*, V (1940), p. viii.

Nolanea cucullata (Favre) comb.nov.
Rhodophyllus cucullatus Favre, *Les champignons supérieures de la Zone Alpine du Parc National Suisse* (1955), 62 (regarded as valid since Bresadola's description of *N. pascua* is in Latin).

Nolanea cuspidifer (Kühn. & Romagn.) comb.nov.
Rhodophyllus cuspidifer Kühn. & Romagn., *Flore Analytique* (1953), 189 (= *Agaricus* (Nolanea) *junceus* var. *cuspidatus* Fr., *Icones Selectae Hymenomycetum*, I (1867), Pl. 99^2, non *Entoloma cuspidatum* (Peck) Sacc., *Sylloge Fungorum*, V (1887), 688.

Nolanea fernandae (Romagn.) comb.nov.
Rhodophyllus fernandae Romagn., *Rev. Mycol., Paris*, **1** (1936), 162.

Nolanea hebes (Romagn.) comb.nov.
Rhodophyllus hebes Romagn., *Rev. Mycol., Paris*, **19** (1954), 4.

Nolanea juncinus (Kühn. & Romagn.) comb.nov.
Rhodophyllus juncinus Kühn. & Romagn., *Rev. Mycol., Paris*, **19** (1954), 5.

Nolanea radiata (J. Lange) comb.nov.
Rhodophyllus radiatus (J. Lange) J. Lange, *Flora Agaricina Danica*, II (1936), 96 (= *Rhodophyllus elaphinus* var. *radiatus* J. Lange, *Dansk. bot. Ark.* No. 2, **11** (1921), 31).

Nolanea sericea (Bull. ex Mérat) comb.nov.
Agaricus sericeus Bull. ex Mérat, *Nouvelle Flore des Environs de Paris* (1821), 78.

Nolanea solstitialis (Fr.) comb.nov.
Agaricus (Leptonia) *solstitialis* (Fr.) Berk. & Br., *Ann. Mag. nat. Hist.*, Ser. 4, **6** (1870), 465 (= *A.* (*L.*) *aethiops* * *A. solstitialis* Fr., *Epicrisis* (1838), 152).

Nolanea tenella (Favre) comb.nov.
Rhodophyllus tenellus Favre, *Les champignons supérieures des Associations fongiques des Hauts Marais Jurassiens* (1948), 212.

Nolanea testacea (Bres.) comb.nov.
N. cetrata var. *testacea* Bres., *Fungi Tridentini Novi*, I (1887), 77, Pl. 83^1.

Nolanea xylophila (J. Lange) comb.nov.
Rhodophyllus xylophilus J. Lange, *Dansk. bot. Ark.* No. 2, **11** (1921), 35.

Omphalina allenii (R. Maire) comb.nov.
Omphalia allenii R. Maire, *Trans. Brit. mycol. Soc.* **3** (1910), 169.

Omphalina brownii (Berk. & Br.) comb.nov.
Cantharellus brownii Berk. & Br., *Ann. Mag. nat. Hist.*, Ser. 2, **2** (1848), 262.

Omphalina cupulata (Fr.) comb.nov.
Cantharellus cupulatus Fr., *Epicrisis* (1838), 367.

Omphalina hepatica (Fr. ex Fr.) comb.nov.
Agaricus (Omphalia) *hepaticus* (Fr. ex Fr.) Berk., *Outlines of British Fungology* (1860), 131 (= *A.* (O.) *pyxidatus* * *A. hepaticus* Fr. ex Fr., *Epicrisis* (1838), 122).

Omphalina mutila (Fr.) comb.nov.
Agaricus (Pleurotus) *mutilus* Fr., *Syst. Mycol.* 1 (1821), 191.

Omphalina obatra (Favre) comb.nov.
Omphalia obatra Favre, *Les champignons supérieures de la Zone Alpine du Parc National Suisse* (1955), 199.

Omphalina retosta (Fr.) comb.nov.
Agaricus (Omphalia) *retostus* Fr., *Epicrisis* (1838), 125.

Omphalina wynniae (Berk. & Br.) comb.nov.
Hygrophorus wynniae Berk. & Br., *Ann. Mag. nat. Hist.*, Ser. 5, **3** (1879), 208.

Phaeomarasmius rimulincola (Rabenh.) comb.nov.
Agaricus rimulincola Rabenh., *Flora Jena*, N.S., **9** (1851), 565.

Pholiota henningsii (Bres.) comb.nov.
Flammula henningsii Bres. apud P. Henn, *Verh. bot. Ver. Brandenb.*, **31** (1889), 171.

Pholiota muelleri (Fr.) comb.nov.
Dryophila muelleri (Fr.) Kühn. & Romagn., *Flore Analytique* (1953), 328 (= *Agaricus* (Pholiota) *squarrosus* *β* *A. muelleri* Fr., *Syst. Mycol.* 1 (1821), 243).

Pholiota ochrochlora (Fr.) comb.nov.
Agaricus (Flammula) *ochrochlora* Fr., *Öfvers. VetenskAkad. Förh. Stockh.* **18** (1861), 24.

Pholiota oedipus (Cooke) comb.nov.
Agaricus (Hypholoma) *oedipus* Cooke, *Grevillea*, **14** (1885), 1.

Pleurotellus filicinus (Vel.) comb.nov.
Pleurotus filicinus Vel., *Mykologia*, **4** (1927), 33.

Psathyrella ammophila (Durieu & Lév.) comb.nov.
Agaricus ammophilus Durieu & Lév., *Explor. sci. Algèrie Atlas* (1868), 14.

Psathyrella catervata (Massee) comb.nov.
Psilocybe catervata Massee, *British Fungus Flora*, 1 (1892), 378.

Psathyrella clivensis (Berk. & Br.) comb.nov.
Agaricus (Psilocybe) *clivensis* Berk. & Br., *Ann. Mag. nat. Hist.*, Ser. 3, **7** (1861), 375.

Psathyrella leucotephra (Berk. & Br.) comb.nov.
Agaricus (Hypholoma) *leucotephra* Berk. & Br., *Ann. Mag. nat. Hist.*, Ser. 4, **6** (1870), 468.

Resupinatus leightonii (Berk.) comb.nov.
Agaricus (Pleurotus) *leightonii* Berk., *Ann. Mag. nat. Hist.*, Ser. 1, **13** (1844), 343.

Rhodocybe griseospora (Pearson) comb.nov.
Collybia griseospora Pearson, *Trans. Brit. mycol. Soc.* **35** (1952), 102.

Rhodocybe hirneola (Fr. ex Fr.) comb.nov.
Agaricus (Tapinia) *hirneola* Fr. ex Fr., *Syst. Mycol.* 1 (1821), 269.

Stropharia aurantiaca (Cooke) comb.nov.
Agaricus (Stropharia) *thraustus* f. *aurantiacus* Cooke, *Handbook of British Fungi*, ed. II (1883–91), 199.

Volvariella parvula (Weinm.) comb.nov.
Agaricus (Volvaria) *parvulus* Weinm., *Hymenomycetes Rossicae* (1836), 238 (= *A.* (V.) *pusillus* Pers. ex Fr., *Syst. Mycol.* 1 (1821), 279, non *A.* (Naucoria) *pusillus* Fr., l.c., 264).

D. DESCRIPTIONS OF NEW SPECIES AND CRITICAL SPECIES, WITH KEYS TO SOME CRITICAL GROUPS

AGARICUS

As will be seen from the 'List', many of the species described by F. H. Møller in his excellent monograph of the genus (Danish *Psalliota* species, *Friesia*, **4** (1950), 1–60; **4** (1951), 135–220) have been discovered in this country and no doubt other finds will follow.

A. GENNADII (Chatin & Boud.) P. D. Orton (see p. 174 and Figs. 1, 2).

Cap 35–70 mm., convex then expanded-convex, sometimes slightly depressed in centre, *flesh very thick*, *white or tinged cream*, then sometimes ivory or pale dirty ochraceous when old, especially in centre, silky smooth, *margin exceeding gills often thick* and floccose-dentate or with appendiculate veil remnants. *Gills* free, narrow, white then pinkish, soon chocolate, crowded, edge paler and minutely floccose at first. *Stem* 25–65/8–15 mm. (10–22 mm. at base) ± equal or slightly clavate-bulbous, sometimes thickened at apex or rather pointed at base, white, discolouring dirty brownish or pallid-pinkish at apex or dirty ochraceous towards base, *apex with scales minutely adpressed or slightly recurved fibrillose* often ± concentric and white discolouring dirty brownish, solid or slightly pithy in lower part, base white tomentose sometimes with white mycelial threads; *veil white*, *thick*, *sheathing* with wide white-floccose ring-like rim when cap is just beginning to expand *then forming basal volva* (Fig. 1) and sometimes a ring-zone above this. *Flesh* white, sometimes becoming dirty chocolate over gills, or dirty brownish in stem cortex, dirty ochraceous in stem base when cut or bruised, soft and spongy in upper part of cap, *firm and hard elsewhere* especially in lower part of stem. *Smell rather strong*, *disagreeable*, sour, 'urinascent'. *Spores* broadly ellipsoid-ovoid, (7)8–10(11)/(5)6–7 μ in print, up to 13/8 μ on gill. *Basidia* (1)–2–(3)–4-spored on same gill, *ca.* 36–44/9–10 μ. *Gill edge* sterile, cells cylindric or clavate 5–10 μ diam.

On the ground in *Cupressus macrocarpa* plantation (22 years old in 1951), Friston, Sussex, 8 Oct. 1951 and 4 Nov. 1952 (legit P. K. C. Austwick), 17 Nov. 1956. This striking mushroom is readily recognized by the volvate veil, large spores and thick-fleshed primarily white cap. *Chitonia gennadii* was originally described from dried material, but I am satisfied that this fungus is the same (confirmed by microscopic characters and its appearance when dry); though Bresadola says of *Clarkeinda cellaris* (collected 'in cellis vinariis') '*Cl. gennadii* affinis, sed bene distincta', I think they are the same on account of similar appearance and spores.

Agaricus luteolorufescens sp.nov.

Pileus 35–95 mm., e convexo convexo-planus leviter late umbonatus, rubrobrunneus vel cacainus subinde vinosotinctus, squamis adpressis ± concentricis variegatus, ad discum piloso-fibrillosus vel fere glaber, ad marginem primo laceratus vel velo fibrilloso-appendiculato decoratus. Lamellae liberae, e pallido-incarnato griseo-incarnatae dein cacainae, e tactu rubescentes. Stipes 45–100/9–12 mm. (infra 12–20 mm. latus), e conico-attenuato subaequalis vel subbulbosus, ex albo griseus vel griseo-incarnatus, infra e tactu lutescens vel ochraceascens, supra annulum glaber vel striatus, infra annulum albofloccosus et squamis brunneofloccosis subinde concentricis variegatus, cavus, ad basim mycelio albo compacto vel radicato; annulus superus, ex albo albidus, tenuis, saepe laceratus, supra glaber vel striatus, infra primo squamis brunneis obtectus. Caro albida, in pileo et ad apicem stipitis fracta rubescens, ad basim lutescens vel ochraceascens. Odor malorum vel acidulus. Sporae ovoideo-ellipsoideae 4½–6(6½)/3–4 μ. Basidia 4-sporigera. Cellulae ad aciem lamellarum cylindrico-clavatae, clavatae vel paulo utriformes, 14–52/6–12(14) μ.

Sub Cupresso macrocarpa, Friston, Sussex, 17 Nov. 1957 (typus in Herb. Kew.); sub Querco ilice, Bossington, Somerset, 25 Nov. 1957. Ab A. lanipede pileo non depresso magis fibrilloso-squamuloso, carne distincte bicolorata, odore pomorum et sporis leviter minoribus differt.

Cap 35–95 mm., convex then expanded ± broadly umbonate, rosy-pallid or *pale reddish brown to chocolate or russet*, sometimes becoming tinged wine-red, ± *concentrically adpressedly fibrillose-scaly*, centre minutely pilose-fibrillose or almost smooth, scales sometimes reflexed at tips and larger and coarser towards margin where pale flesh may show through in places, margin exceeding gills often at first lacerate or with fibrillose-appendiculate veil. *Gills* free, barely ventricose, pale flesh then greyish flesh colour, finally pale to deep chocolate, crowded, edge minutely whitish flocculose at first, whole bruising reddish when fresh. *Stem* 45–100/9–12 mm. (12–20 mm. below), conico-attenuated then ± equal with or without clavate or bulbous base, white then discoloured greyish or grey flesh colour, *yellowish or ochraceous below* when handled or with age, smooth or floccose-striate above ring, silky striate and minutely white flocculose and also with *pale chocolate floccose* or floccose-fibrillose *sometimes concentric scales* below ring, hollow, base often with compacted white mycelium or mycelial 'root'; ring pendulous, white then whitish, thin, often torn, smooth or striate above, when fresh *pale chocolate floccose-scaly below*. *Flesh* whitish or tinged flesh colour, when cut *bright carmine or rosy in cap* and cortex of stem apex, fading to brownish red or dirty buff, *yellowish or ochraceous in cortex of lower part of stem*. *Smell* of *apples* or fruity-acidulous when cut. *Spores* ovoid-ellipsoid, 4½–6(6½)/3–4 μ. *Basidia* 4-spored. *Gill edge* sterile, cells cylindric-clavate or slightly utriform to clavate, 14–52/6–12(14) μ.

Under *Cupressus macrocarpa*, Friston, 17 Nov. 1957 (type in Herb. Kew); under *Quercus ilex*, Bossington, 25 Nov. 1957. Near *A. lanipes* F. H. Møller, but cap more fibrillose-scaly and not depressed, flesh distinctly bicoloured, smell of apples and slightly smaller spores. It remains to be seen if this is really distinct from *A. lanipes*, which I have not yet collected. *A. silvaticus* lacks clearly bicoloured flesh and has no scales on underside of ring, while the flesh of *A. haemorrhoidarius* turns immediately entirely bright red when cut and the cap is less scaly.

Agaricus vinosobrunneus sp.nov.

Pileus 43–90 mm., e convexo planus interdum leviter depressus vel umbonatus, umbrinus vel vinoso-brunneus, ad marginem pallidiore coloratus, squamis adpressis ± concentricis variegatus, ad discum subglaber, ad marginem primo velo appendiculato decoratus. Lamellae liberae, pallido-incarnatae dein griseo-cacainae postremo dilute umbrinae vel cacainae, ad aciem concolores dein subtiliter alboflocculosae. Stipes 40–115/8–13 mm. (infra 12–26 mm.), sursum attenuatus vel clavato-bulbosus, albus, ad apicem griseo-cacaino decolorans, supra annulum subtiliter striatus vel flocculosus, infra annulum squamis albo-floccosis obtectus; annulus superus, ex albo griseo-cacaino decolorans, interdum laceratus, supra ± striatus, infra albofloccosus. Caro pilei et ad apicem stipitis ex albo lente rubescens, ad basim stipitis interdum pallido-ochraceascens. Odor nullus vel debilis acidulus. Sporae ovoideo-ellipsoideae 5–7/3–4 μ. Basidia 4-sporigera. Cellulae steriles ad aciem lamellarum primo nullae postremo ± clavatae 18–38/10–18 μ.

In silvis deciduis, Surlingham Wood, Surlingham, Norfolk, 21 Oct. 1957 (typus in Herb. Kew.). Ab A. lanipede pileo vinoso-brunneo, carne minus rubescente, acie lamellarum primo fertile differt.

Cap 43–90 mm., convex then expanded ± plane with slightly inflected margin or truncate-umbonate, sometimes slightly depressed when old, rather deep *vandyke or date-brown with wine-red or purplish red tinge* especially at and round centre, paler towards pale reddish brown, pallid, or whitish margin, with ± *concentric adpressed purplish umber fibrillose scales* round even or slightly cracked-scaly centre, these scales more dispersed towards margin, margin exceeding gills, at first with whitish appendiculate veil. *Gills* free, at first pale but rather *bright flesh-pink* especially towards base, then pale greyish chocolate, finally pale umber or reddish chocolate, crowded, edge concolorous and even, then minutely white flocculose in places. *Stem* 40–115/8–13 mm. (12–26 mm. at base), thickened below or clavate-bulbous, white then discoloured dirty pinkish or greyish chocolate at apex, minutely silky striate or slightly adpressed floccose-scaly above ring, *distinctly white floccose or floccose-scaly below ring*, slightly pithy then narrowly hollow; *ring* pendulous, white then discoloured like stem apex, ± striate above, *white floccose beneath*, sometimes fairly thick at edge or splitting. *Flesh* white or whitish, slowly (1 min. or more) turning *pinkish flesh or reddish* in places when cut especially in cap centre and upper stem, sometimes dirty ochraceous in lower stem. *Smell* none or faintly fruity-acidulous when cut. *Spores* ovoid-ellipsoid 5–7/3–4 μ. *Basidia* 4-spored. *Gill edge fertile* at first then often sterile in places (cells ± clavate 18–38/10–18 μ).

Under mixed deciduous trees (beech, oak, elm), Surlingham Wood, 10, 21 Oct. 1957 (Tuck's Plantation, type in Herb. Kew), 4 Oct. 1958. The changing character of the gill edge was constant for all these collections, often remaining fertile even when the cap was expanded. Nearest, perhaps, to *A. lanipes* F. H. Møller, from which it differs in deeper coloured more wine-brown cap, flesh colour-change and habitat. This may be *A. lanipes* var. *verecundus* F. H. Møller (but *A. verecundus* is in any case antedated by *A.* (Nolanea) *verecundus* Fr., 1838). *A. silvaticus* is duller coloured and has a constantly sterile gill edge.

AGROCYBE ATTENUATA (Kühn.) P. D. Orton (see p. 174)

Cap 8 mm., convex-expanded, dirty yellowish ochraceous or pallid-buff slightly deeper ochraceous at centre, not striate when moist. *Gills* adnate, ± ventricose, pale pallid-buff or ochraceous-clay then pale snuff, not crowded, L 18 l 1(–3), edge slightly paler and minutely flocculose. *Stem* 12/1 mm., slightly thickened at base, concolorous at apex, darker sepia at base, ± entirely pale buff silky-fibrillose-floccose, base with mycelial strands 8 mm. long. *Flesh* pale yellowish deeper ochraceous-yellowish in cap centre. *Smell* none, *taste* mealy. *Spores* ellipsoid with small germ pore, 6–8/4–5 μ. *Marginal cystidia* lageniform with subcapitate apex to ± utriform, 30–50/(8)10–20 μ, apex 6–11 μ; *facial cystidia* similar or a few vesiculose-fusiform, 45–60/12–20 μ, apex 8–14 μ. Cap cuticle cellular, cells 8–20 μ diam.

On ash twig, Surlingham Wood, Surlingham, Norfolk, 13 Oct. 1957 (legit E. A. Ellis). This description is of a small agaric which I think is the same as that described by Kühner as *A. firma* var. *attenuata*. As it is so very different from the original description of *A. firma*, especially in colours and size, I prefer to treat it as a separate species. It differs from *A. pusiola* in smaller spores and habitat on wood and from all other European species of *Agrocybe* so far described by the shorter and narrower spores.

AMANITA CROCEA (Quél.) Kühn. & Romagn. (= *A. vaginata* var. *crocea* Quél. apud Bourdot)

When collecting agarics with A. A. Pearson in Scotland in 1952 we found an *Amanita* which puzzled us and looked like a large *A. fulva* with a distinctly scaly stem. This is figured as '*A. inaurata* bright yellow form' in a notebook of A. A. Pearson now in Herb. Kew, though the colour is not bright yellow but tawny-ochre. I have since seen this in different parts of England and Scotland on several occasions but have unfortunately made no detailed descriptions. It is, however, clearly different and readily distinguished from *A. inaurata*, not only by the differently coloured cap and stem but also by the ample persistent volva which is at first white outside then whitish or tinged with the colour of the cap and does not break up like that of *A. inaurata*. Also the patches on the cap are large and white at first but soon disappear, unlike the smaller greyish and more persistent patches of *A. inaurata* and the margin of the cap seems to be less strongly striate. It resembles *A. fulva* much more closely, but differs in more robust habit, especially of the stem, and in having the stem at least in part concentrically scaly. It is quite well figured by Gilbert (Bres., *Ic.*

Myc. Suppl. 1, Pl. 3) as *A. vaginata* var. *crocea*. I have included it in the 'List' as a species, following Kühner & Romagnesi, since it is readily recognizable in the field. I have found it most frequently under birch—in fact it may be always in association with this tree; further field work must decide this. Here is a brief description compiled from various sources:

Cap about 50–80 mm., convex then expanded often umbonate, *tawny ochre or pale orange*, sometimes fading to yellowish when old, margin striate, at first with patches of white or whitish volva but usually soon smooth. *Gills* free, white, crowded. *Stem* about *100–230/10–24 mm.*, often attenuated upwards, at first entirely covered with *rather thick scales coloured like the cap or paler* and often concentrically arranged and smaller on the upper stem, later they may be absent from the upper part. *Volva ample, white or whitish* then sometimes tinged cap colour especially near the edge, which often splits with age, up to 75 mm. high and 45 mm. broad. *Spores* globose or subglobose 9–12(13)/8–11(12) μ, non-amyloid.

Edzell, Angus, 31 Aug. 1952 under birch and pine and elsewhere; also Porlock, Som., 30 Aug. 1954, in mixed oak and birch wood (legit D. A. Reid).

Boletus discolor and *B. junquilleus*

One specimen of a yellow *Boletus* agreeing with *B. pseudosulphureus* Kallenbach (*Pilze Mitteleuropas*, 1 (1923), Pl. 5), and with the fungus described by Imler as *Tubiporus junquilleus* and figured as *T. erythropus* var. *junquilleus* (*Bull. Soc. mycol. Fr.* **66** (1950), 190, Pl. 3) was gathered under beech at Gannochy, Edzell, Angus, on 16 Sept. 1958. Whilst agreeing with Imler that this fungus is similar in some respects to *B. erythropus*, differing mainly in being almost entirely yellow, I think this distinctive colouring and especially the complete absence of orange-red tints in the pores make this fungus a species distinct from *B. erythropus*.

The original diagnosis of *B. junquilleus* Quélet states that it may be 'une forme de *discolor* dont il ne diffère que par les tubes concolores'. Unfortunately Quélet does not specifically state the colour of the stem of *B. junquilleus*, his description of the stem being 'pruineux pubescent, tomenteux et rougeâtre à la base'. In the original diagnosis of *Dictyopus luridus* [var.] *discolor* Quélet states the stem to be 'jonquille, pointillé de granules rouge orangé'. This infers a red-punctate stem for *B. junquilleus*, distinctly shown in the Boudier plate (Boud. 148). It seems better, therefore, to regard *B. junquilleus* s. Quélet, Boudier as a synonym of *B. discolor* and to synonymize *B. junquilleus* s. Imler, which has a yellow-punctate stem, with *B. pseudosulphureus*. The latter is possibly stouter and more robust than *B. discolor*. The validity of the so-called 'cold weather colour forms' of Kallenbach (Kall 5^{12-13}) remains to be proved in the field, but to my mind these 'forms' are more likely to be *B. queletii*, in view of the red flesh in the stem base, not found in my specimen nor mentioned by Imler for his *B. junquilleus*.

B. discolor was recorded by Reid (these *Trans.* **38** (1955), 395). A painting by Reid of his collection shows very strong resemblance to Boudier's plate of *B. junquilleus*. It is maintained distinct from *B. queletii* and *B. erythropus* on account of the yellow cap and the red (not purplish red) flesh in the stem base. *B. junquilleus* Quél. s. Quél., Boud. (= *B. discolor* Quél.) may be distinguished from *B. pseudosulphureus* Kallenb. (= *B. junquilleus* Quél. s. Imler non Quél., Boud.) thus:

B. junquilleus	B. pseudosulphureus
Pores red-orange at least near stem	Completely yellow
Flesh red in stem base	Yellow or brownish but not red in stem base
Stem red punctate	Yellow punctate

CLAUDOPUS DEPLUENS (Batsch ex Fr.) Gillet (= *Agaricus* (Crepidotus) *depluens* Batsch ex Fr., *Syst. Mycol.* 1, 275) (Fig. 239)

A small, laterally stemmed fungus was sent to me by R. Watling of Halifax in July 1957. The spores were angular but of a different size and shape from those of *C. byssisedus*. The macroscopic characters and habitat (on soil) agreed with those given by Fries for *C. depluens* and this name is therefore reinstated.

Cap about 7 × 5 mm., reniform, pinkish grey, entirely hoary at first, later at centre only, and becoming slightly deeper pinkish round margin, which is incurved at first, slightly downy pubescent round point of attachment at first. *Gills* pale grey then grey-pink, finally salmon-pink, rather distant. *Stem* rudimentary, *ca.* 1–2/0·3–0·5 mm., pale grey and slightly downy, evanescent. No smell or taste noted. *Spores* rather broadly ellipsoid, 6–7–(8)-angular, 10–12/7–8½ μ (Fig. 239). *Gill edge* with sterile ± clavate cells *ca.* 45/10 μ.

On soil in a plant-pot, Wood End, Scarborough, Yorks, 18 July 1957 (also 11 Apr. 1957), legit R. Watling. This differs from *C. byssisedus*, which is also grey but has ellipsoid oblong, nodulose-angular spores 9½–12/6–7 μ (Fig. 240), not only in the broader spores but also in the hoary, not tomentose, cap. It agrees well with the Friesian diagnosis of *depluens*, especially cap 'rufescente cano', stem 'in junioribus adest, villosus, dein evanescens' and habitat 'ad terram supra muscos, etc.'.

CLITOCYBE INCOMIS (Karst.) P. D. Orton (see p. 174 and Fig. 241)

Cap 7–30 mm., convex then expanded, umbilicate (sometimes shallowly so), sometimes depressed with upturned margin when old, *pallid- or dirty ochraceous-buff to dirty reddish brown or dull date-brown*, sometimes darker at centre (almost sepia), drying paler (dirty buff), not striate when moist, silky-hoary or matt with slight silky sheen when dry, sometimes minutely scurfy-scaly, scales adpressed or slightly reflexed, margin sometimes becoming split or appearing rimose due to the cuticle cracking radially. *Gills* adnate emarginate with tooth to decurrent, sometimes rather broad, sometimes arcuate, *whitish then tinged clay or dirty greyish brown* especially near flesh of cap, not crowded, L 14–28 l (0) 1–3 (5), edge sometimes rather thick but ± even. *Stem* 12–45/1–3 mm. (< 4 when compressed), equal or thickened at base or apex or attenuated downwards, sometimes flexuose or compressed, concolorous or paler (dirty ochraceous), minutely silky striate, *rather tough*, stuffed then hollow. *Flesh* whitish pallid or pallid-ochraceous, darker horny over gills or in stem cortex when moist. *Smell strong mealy* especially when cut. *Taste* mealy then slowly (30–60 sec.) bitterish. *Spores broadly ellipsoid*, $7–10(11)/5–6\frac{1}{2}(7)\,\mu$, non-amyloid, smooth sub immers. (Fig. 241). *Basidia* 4-spored, 32–42/8–10 μ, non-carminophile (F.B.H.). *Gill edge* fertile, no cystidia. Hyphae of cap cuticle filamentous, hyaline or encrusted pigmented, sometimes clamped, 3–10(14) μ in diam. Reaction with $FeSO_4$ *nil* (F.B.H.).

On mossy or grassy ground or in soil, especially under conifers, Witley Common, Surrey, 25 Oct. 1956 and 13 Dec. 1956, also 1 Nov. 1945 (legit A. A. Pearson as *Collybia clusilis*); The Manor, Rothamsted, Herts, 8 Nov. 1958; in *Abies* plantation, Covenhope, Herefordshire, 22, 29 Nov. and 5 Dec. 1959. This fungus was recorded as *Collybia clusilis* by A. A. Pearson (in litt.) and also by Rea judging by his description (*British Basidiomycetae* (1922), p. 342), but I regard *Agaricus* (Collybia) *clusilis* s. Fries as doubtful and prefer to use Karsten's name for this not uncommon fungus. *Omphalia clusiliformis* Kühn. & Romagn. (= *Collybia clusilis* s. Konrad & Maubl., Bres.) has longer spores $9\frac{1}{2}–11\frac{1}{2}(12\frac{1}{2})/5\frac{1}{2}–6\frac{1}{4}(7)\,\mu$ and turns 'noirâtre-ardoisé' with $FeSO_4$.

Clitocybe squamulosoides sp.nov.

Pileus 34–65 mm., mox planus, ad discum leviter vel aliquantum depressus, saepe papillatus vel umbone parvo obsitus, pallido-brunneus vel fuscobrunneus saepe ad discum obscuriore coloratus, subtiliter innato-flocculosus vel squamis flocculosis adpressis praecipue ad discum variegatus, siccitate subtiliter nitidus, ad marginem in longinquum tempus involutus. Lamellae decurrentes, ± arcuatae, angustae, ex albido cremeo-lutescentes, subdistantes, L 32–44 l 1–3, interdum senectute furcatae vel venosae. Stipes 30–40/4–10 mm., ± aequalis vel deorsum attenuatus, interdum compressus vel ad basim incrassatus, pileo fere concoloratus, subtiliter sericeo-striatus, ad apicem circa lamellas albidosericeo zonatus, farctus. Caro pilei alba, stipitis pallida, sub cuticula obscuriore colorata. Odor acerbo-suavis. Sporae ellipsoideae, $7–8/3\frac{1}{2}–4\,\mu$. Cystidiae nullae. Hyphae cuticulae pilei filamentosae, ramosae, interdum fibulatae, 4–8(10) μ latae, hyalinae vel incrustato-pigmentatae.

In silvis coniferis, Witley Common, Surrey, 13 Dec. 1956 (typus in Herb. Kew.); C. trullaeformis sensu J. Lange idem censeo. A C. trullaeforme sensu Fries, Bres., Joss. lamellis coloratis, sporis C. trullaeformis sensu Fries, Bres., Joss. a lamellis albis, sporis brevioribus $5–6\frac{1}{2}/3–4\,\mu$, C. squamulosa a coloribus pallidioribus, odore farinaceo, sporis formae lacrymae differunt.

Cap 34–65 mm., soon plane and slightly to rather deeply depressed, sometimes papillate or with small umbo, pallid sepia-buff to *sepia*, *sometimes darker blackish sepia at centre*, *matt and minutely innately silky flocculose to distinctly adpressedly flocculose-scaly*, especially at or round centre, slightly shiny when dry (kid-glove like), margin often remaining incurved for some time. *Gills* decurrent, often deeply so, ± arcuate, rather narrow, *whitish then yellowish or creamy*, not to fairly crowded, L 32–44 l 1–3, sometimes forked near stem, becoming crisped or veined at base when old or in larger specimens. *Stem* 30–40/4–10 mm. equal or attenuated downwards, sometimes slightly swollen at base or compressed, concolorous or slightly paler or darker, minutely silky striate, with whitish silky zone round base of gills (like *C. umbilicata*), stuffed. *Flesh* white in cap, pale dirty brownish in stem, darker under cap and stem cuticles. *Smell* pungent-sweetish rather strong. *Spores* ellipsoid, $7–8/3\frac{1}{2}–4\,\mu$ ($6–8/4–4\frac{1}{4}\,\mu$ sec J. Lange).

Basidia 4-spored 28–36/7–8 μ. No cystidia on face or edge of gills. Hyphae of cap cuticle filamentous, branched, sometimes clamped, 4–8(10) μ diam., hyaline or encrusted pigmented.

Under pines. Witley Common, Surrey, 13 Dec. 1956 (type). This is *C. trullaeformis* s. J. Lange. *C. trullaeformis* s. Fries, Bres., Joss. differs in shorter spores 5–6½/3–4 μ and white gills. *C. squamulosa* (no authentic British record) differs in paler colours, mealy smell and tear-drop-shaped spores 6–8/3–4 μ.

CLITOPILUS HOBSONII (Berk. & Br.) P. D. Orton (see p. 174 and Fig. 242)

I have examined type material of *Agaricus* (Pleurotus) *hobsonii* Berk. & Br., 1860, and found the spores to be ellipsoid-amygdaliform, 7–9/4½–5½ μ, with 7–11 longitudinal ribs showing as angles when the spores are seen end-on (Fig. 242*a*). These are therefore of the form found in *Clitopilus* sensu stricto as used in the 'List'. As the macroscopic features of *A. hobsonii* are similar to those of *C. pleurotelloides* (Kühner) Joss. (= *Octojuga pleurotelloides* Kühn., 1926), the latter is included in the 'List' as a synonym of *C. hobsonii*, since the epithet *hobsonii* has priority. The use of the epithet *septicoides* for this species is discussed in Part II, p. 214, but the epithet *septicoides* (P. Hennings, 1904) is antedated by *hobsonii*, so that even if the two were identical its use would not be permissible.

C. hobsonii is not uncommon in Britain, at least in the south, but has undoubtedly been mistaken for a species of *Pleurotus*, *Claudopus* or *Crepidotus* in the past. Since the gills tend to remain whitish for a long time it is only too easy to be deceived by it, as did in fact happen to me as recently as Nov. 1959, when I laboriously made a large collection from a fallen ash in Somerset of what I believed and hoped to be a species of *Pleurotellus* (i.e. a small *Pleurotus* with white spore print) which I had not seen before, only to find the next morning that the spore print was pink and the spores longitudinally ribbed! The spores of some of my collections have shown a range of size (6½–8½/4–4½ μ) slightly smaller than those of the type material; however, the combined range of all my collections (6½–9(10)/4–5½ μ) is very nearly the same as Kühner & Romagnesi give for *C. pleurotelloides* (6½–9½/4–5½ μ, *Fl. Anal.* (1953), p. 175), so I regard this species as one showing a fair variation in spore size. The description is made from a number of British collections:

Cap 5–18(30) mm., convex then expanded, orbicular or slightly reniform, less commonly lobed or shell-shaped, attached laterally or with very short stem, *at first pure white* then sometimes pale greyish in outer part, especially when moist, or tinged dirty cream colour when old, entirely villose-tomentose at first, later silky tomentose or silky smooth in outer part, not striate, margin incurved for a long time. *Gills* meeting at an excentric point, *white then for a long time whitish, pale dirty cream or greyish, finally creamy-pinkish*, usually rather crowded, L 10–20 l 3–7(11), edge even or minutely flocculose when fresh. *Stem* usually absent, sometimes very excentric or lateral, ½–2/½–1 mm., white, pubescent-tomentose. *Flesh* white, thin. *Smell* strong, *mealy*, especially when cut. *Taste mealy*. *Spores*

6½–9(10)/4–5½ μ, ellipsoid-amygdaliform *with 7–12 longitudinal ribs* showing as obscure angles when seen end-on (Fig. 242). *Basidia* 4-spored, 24–30/7–8 μ. *Gill edge* fertile (in old specimens filamentous hyphae 2–4 μ diam. may project along the edge as in some other small Pleurotaceae). Hyphae on cap, hyaline, filamentous 1–5 μ diam. over wider ones 5–10(12) μ diam.

On stumps, logs, twigs, herbaceous stems and other plant debris. Juniper Hill, Mickleham, Surrey, 10 Oct. 1952, on rotten beech stump; Windsor Forest, Berks., 25 Oct. 1953; Norbury Park, Mickleham, 5 Oct. 1955 on old Polypore and on rotten beech log; Horner Water, Som., 8 Nov. 1959 on fallen ash; Surlingham, Norfolk, 31 Jan. 1960 on honeysuckle bark (legit E. A. Ellis). Best recognized by pink spore print, mealy taste and smell and spores with longitudinal ribs.

French mycologists recognize another species of *Clitopilus* with short lateral stem, *C. pinsitus* (Fr.) Joss. This is an interpretation of *Agaricus* (Pleurotus) *pinsitus* Fr., *Syst. Mycol.* 1 (1821), 184, described and discussed by Josserand (*Bull. Soc. mycol. Fr.* **53** (1937), 209). It differs from *C. hobsonii* in being consistently larger (cap 15–40 mm.) and in having spores, although of the same size, with less marked longitudinal ribs ('très arrondis, peu manifestes mais incontestables'). I have collected *C. hobsonii* with cap 30 mm., but the usual range of size I have found to be 5–18 mm. There is no evidence of Josserand's fungus in Britain as yet. Since Fries mentions a smell of meal for *A. pinsitus* it was very likely a species of *Clitopilus*; I am not prepared to discuss whether *pinsitus* s. Josserand and *hobsonii* are really distinct or not at the moment.

Collybia (Tephrophana) **confusa** sp.nov. (Fig. 243)

Pileus 15–33 mm., e convexo mox expansus vel leviter depressus, interdum obtuse umbonatus, fuscus vel obscuriore brunneus, vulgo ad marginem pallidiore coloratus interdum luteolotinctus, siccitate pallide sordide cremeus vel argillaceus, a disco ad marginem pallens, jove pluvio exstriatus vel solum ad marginem levissime striatus. Lamellae adnatae interdum emarginatae vel dente decurrentes, albidae dein sordide cremeae vel colore cornus tinctae, subconfertae, L 28–38 l (0)1–3, ad aciem interdum pallidiore tinctae. Stipes 28–60/2–4 mm., aequalis vel deorsum attenuatus, ex albo aut supra albidus infra colore pilei tinctus aut fere totus fuscus vel obscure brunneus, totus minute albo-sericeo fibrillosus, e farcto cavus, ad basim albo-tomentosus. Odor aut debilis aut aliquantum fortis, rancido-farinaceus. Sapor forte farinaceus. Sporae late ovoideo-ellipsoideae, 4½–6½/3–3½ μ (Fig. 243). Basidia granulas carminophilas habent (fide F.B.H.). Cystidia nulla.

Ad terram in silvis, praecipue coniferarum, Covenhope, Herefordshire, 12 Dec. 1959 (in Abietum, typus in Herb. Kew.). A coloribus, sporis brevibus aliquantum latis, pileo jove pluvio exstriato vel haud striato, stipite sericeo-fibrilloso insignis. Collybia ozes sensu J. Lange idem censeo, sed non sensu Fries, quae a pileo jove pluvio striato, stipitis 'e medullato fistuloso gracili subflexuoso apice subfarinaceo', lamellis 'e cinereo olivaceo-fuligineo' differt. A speciebus alteris plurimis Tephrophanae sporis brevioribus differt.

Cap 15–33 mm., convex then expanded or slightly depressed, sometimes obtusely umbonate, *sepia or vandyke*, *often with paler sometimes slightly yellowish margin*, drying pale dirty cream or pallid clay from centre, when moist *not striate or very indistinctly so* at margin only, when dry with slight radial silky sheen. *Gills* adnate sometimes emarginate or with tooth, whitish then dirty cream or tinged grey-horn, fairly crowded, L 28–38 l (0)1–3, edge even, sometimes paler. *Stem* 28–60/2–4 mm., equal or attenuated downwards, silky white, soon either whitish above and tinged colour of cap below or almost entirely sepia or vandyke, *entirely minutely white silky-striate*, stuffed then hollow, base white tomentose. *Flesh* concolorous, drying paler inside, often horny over gills. *Smell* faint or rather strong rancid-mealy. *Taste* strong mealy. *Spores* ellipsoid or ellipsoid-ovoid, $4\frac{1}{2}$–$6\frac{1}{2}$/3–$3\frac{1}{2}$ μ (Fig. 243). *Basidia* with carminophile granules (fide F.B.H.), 4-spored. *Cystidia* none.

On the ground in woods (chiefly of conifers). Clumber Park, Notts., 7 Sept. 1956 (legit Miss Kennedy); Covenhope, 12 Dec. 1959 (in *Abies* plantation, type in Herb. Kew). Distinguished by colours, short rather broad spores, not or indistinctly striate cap and silky fibrillose stem. I think this is *C. ozes* s. J. Lange despite slight difference in spore measurements but not *C. ozes* s. Fries, which differs in the cap being striate when moist, the stem 'e medullato fistuloso gracili fragili subflexuoso apice farinaceo', and the gills 'e cinereo olivaceo-fuligineis'. Most other species of subgenus TEPHROPHANA have longer spores, but *Lyophyllum baeospermum* Romagn. (*Fl. Anal.*, p. 165), also with small spores, lacks the silky fibrillose stem and has slightly narrower spores.

CONOCYBE

A large number of names new to the British list appears under this genus, largely as a result of Kühner's work on the genus. Some of Kühner's names in his work are not valid according to the Rules, since they date after 1 Jan. 1935 and have no Latin diagnoses. I hope to deal with this problem later, should it still be necessary, and also to publish a key to the genus in the near future.

C. blattaria and *C. togularis*

In deciding which interpretation of these epithets to adopt, it is necessary to refer first to the original descriptions by Fries in *Syst. Mycol.* 1 (1821) in which (p. 241) *Agaricus* (Pholiota) *togularis* is described as having the stem '3 unc. longus, 3 lin. crassus, subaequalis, fragilis, pallidus, annulo albo' and the cap 'mox planus, 3 unc., pallescens' and 'subargillaceo'; *A.* (P.) *blattarius* (p. 246) is stated to have the stem '2 unc. longus, 1 lin. crassus, aequalis, sericeus, albus' and the cap 'planiusculus, ½–1 unc. latus, disco subumbonato obscuriore laevi, margine striato' and 'ferrugineo expallente'. The ring of *A. togularis* is 'reflexo' (in *Epicrisis* (1838) also 'integro distante') but 'distans, laevis, albus' in *A. blattarius*, which is described as 'parvus' and later 'pusillus'. In later works Fries modified and augmented these descriptions; in *Monographia* (1851) he replaced the name *togularis* temporarily by *arrhenii* and described three forms A, B and C, of which A corresponds most closely to his original description and to J. Lange's interpretation and C suggests *filaris*. In *Hymenomycetes Europaei* (1874) Fries stresses cap 'exstrio' for *togularis* (*arrhenii* is abandoned) and 'margine striato' for *blattarius*. In *Icones Selectae* (1884) he illustrates a slender agaric (Pl. 104^4) as '*togularis*' but in the text describes this as var. *filaris*, for which he quotes this illustration, so that this is irrelevant to the question of *togularis*, but an agaric corresponding to this variety is included in the 'List' as *C. filaris* following J. Lange (illustrated as *togularis* by Bresadola and has probably been named thus in the past by others). From the descriptions there can be no doubt that Ricken (*die Bl.*, p. 199) has reversed the sense of these epithets, using *blattaria* for the thicker-stemmed agaric with relatively small spores and *togularis* for a more slender one with larger spores, this reversal being adopted by Kühner (1935). Ricken, however, does not state whether the basidia of his *Pholiota togularis* are 2- or 4-spored, but judging by the spore size given (10–12/5–6 μ) and the fact that he does not specify a striate cap and shows a strongly striate ring in his figure, I think *togularis* s. Ricken is most likely the fungus I have described as *C. vexans*. Konrad & Maublanc *Ic. Sel.* 69^2, *blattaria* I also believe to be *C. vexans* for similar reasons. Kühner (*Galera*, p. 161) gives separate descriptions for a 'forme tétrasporique' and a 'forme bisporique' under *C. togularis*; the spore size ((10)10·7–13(14·5)/(5)5·5–7·2 μ), well-marked striate ring and the remark that the cap is usually non-striate given for 'forme tétrasporique' suggests that this too is *C. vexans*. I have retained the epithet *blattaria* for *C. togularis* forme bisporique Kühn. (= *Pholiota teneroides* J. Lange) since this is stated to have a striate cap in the description of R. Maire, given by Kühner and by J. Lange, and a less distinctly striate ring, these features agreeing with the original Fries (1821) description of *Agaricus blattarius* 'pileus ferrugineus expallente...margine striato' and 'annulus laevis, albus'. I think the 4-spored fungus well worth separating as a species on account of the above-mentioned characters of cap and ring and have therefore described it as a new species, *C. vexans*. It is not possible to establish the identity of *togularis* and *blattaria* as described by older British authors in the absence of microscopic details. *C. togularis* was described as *Agaricus* (*Pholiota*) *mesodactylius* by Berk. & Broome. Since Rea gives small spores (7–8/3–4 μ for *togularis* and 8–10/4–5 μ for *blattaria*) accompanied by details of cystidia from Ricken, his descriptions must be regarded as mixtures. Since Ricken's descriptions do not agree with the originals I prefer to follow J. Lange, Boudier and some older authors in using the epithet *togularis* for the thicker-stemmed, duller coloured agaric described as *blattaria* by Ricken and Bresadola and *blattaria* for the smaller, darker coloured agaric described as *Pholiota teneroides* by J. Lange and *C. togularis* f. *bisporique* by Kühner. In my field experience *C. togularis* s. Fries is seen most frequently with a non-striate cap and *C. blattaria* s. Fries striate when moist. It will be noted that the question of whether the ring is striate or not is not stressed since Fries does not mention this character for *togularis*.

I have found these small ringed agarics particularly puzzling for some time now and have ventured to describe below two new species and include here a key to those species with a distinct membranous ring, all growing on the ground (*percincta* was also found on old rotten straw).

Key to Conocybe

(species with distinct membranous ring)

1. Spores 6–10/4–5 μ; basidia 4-spored **2**
1. Spores 10–14/5–7 μ; basidia 2- or 4-spored **3**
   2. Slender (cap 4–15 mm., stem 0·7–1·5 mm. diam.); stem white, soon discolouring yellowish or brownish (deeper at base); marginal cystidia lageniform sometimes slightly capitate or with flexuose neck, 24–46(52)/7–10 μ, apex 2–4(6) μ diam., neck 8–14 μ long; autumnal *filaris*
   2. More robust (cap 9–28 mm., stem 1–4 mm. diam.); stem more persistently white, but discoloured brownish below when old; marginal cystidia more variable, cylindric-flexuose or slightly swollen below to lageniform; vernal, but also sometimes found in late autumn *togularis*
3. Cap and stem tawny-honey or rusty; cap striate when moist, often remaining convex or conico-convex for a long time, 7–20(28) mm.; stem not conspicuously floccose-scaly below ring at first; ring sometimes rather small or only striate where it joins stem; spores 11–14/5–6 μ; basidia 2-spored; marginal cystidia variable, clavate, utriform or lageniform *blattaria*
3. Cap and stem frequently paler; cap not or slightly striate at margin only when moist, expanding or not, 8–38 mm.; stem whitish or yellowish floccose-scaly below ring at first, then smoother and darker brown; ring well formed, often strongly striate; basidia 2-, (3-) or 4-spored **4**
4. Basidia 2-spored or 2–3(–4) spored on same gill; spores 10–12/5–6 μ (Fig. 245); marginal cystidia cylindric-clavate or utriform or irregular fusiform-lageniform, 26–44/7–20 μ, apex (4)6–12 when utriform or lageniform; ring large (6–10 mm. diam.), pale yellowish; stem below ring yellowish floccose-scaly; cap 12–38 mm., yellowish with deeper ochre-yellow, honey or date-brown centre when moist; stem 24–82/1½–5 mm.; on old rotten straw or on soil by road in wood *percincta*
4. Basidia 4-spored; spores 10–12/6–6½ μ (Fig. 246); marginal cystidia Urtica-hair shaped or lageniform with rather long sometimes curved or flexuose neck with a few shorter clavate ones between, 22–54/7–12 μ, apex 2–4 μ diam., neck 12–28 μ long; ring fairly large (*ca.* 3–5 mm. diam.), whitish or pale dirty yellowish often strongly striate above; stem below ring whitish or pale dirty yellowish floccose-scaly at first; cap 8–17 mm., ochre-honey or yellowish ochraceous when moist; stem 35–64/1½–3 mm.; on soil in shady places *vexans*

Conocybe dunensis T. J. Wallace *in litt.* sp.nov. (Figs. 3–4, 244, 398)

Pileus 10–30 mm., e conico-convexo conico-expansus, rariore convexo-umbonatus, sordide luteolo-brunneus, umbrinus vel fulvo-fuscus, jove sicco pallido-ochraceus, jove pluvio ad marginem indistincte striatus. Lamellae adnatae, ex albido pallido-mellinae dein ferrugineo-mellinae, subconfertae, L 18–30 l 1–3, ad aciem subtiliter flocculosae. Stipes 40–100/2–4½ mm., sursum attenuatus vel subaequalis, albidus vel pallido-ochraceus, sursum obscuriore ochraceo decolorans, pruinoso-striatus, saepe fibroso-canaliculatus, aliquantum fragilis, deorsum pallidiore coloratus vel albus et in arena radicatus. Caro tenuis, concolorata. Odor nullus. Sporae ellipsoideae leviter amygdaliformes poro germinativo (10)12–14(15)/7–8(9) μ (Fig. 244). Basidia 4-sporigera. Cystidia aciei lamellarum lecythiformia 16–28/7–12 μ capitulo 3–5 μ (Fig. 398); cystidiae stipitis similes. Cellulae cuticulae pilei pyriformes vel spheropedunculatae 12–25 μ diam.

In sabulis maritimis, Dawlish Warren, Devon, 17 Nov. 1951 (typus in Herb. Kew.), legit T. J. Wallace. C. tenera a coloribus clarioribus, pileo jove pluvio distincte striato, habitatione, C. semiglobata a coloribus et habitatione differunt.

Cap 10–30 mm., conico-convex, less commonly convex-umbonate then conico-expanded, pallid buff, date-brown, tawny-buff or dark liver colour (*generally dull-coloured*), drying pale buff or ochraceous often with tawny tinge at centre, not or indistinctly striate when moist. *Gills* adnate, sometimes narrowly so, ± ventricose, *whitish, soon pale honey* then rusty-honey or rusty-buff, fairly crowded, L 18–30 l 1–3, edge minutely flocculose when fresh. *Stem* 40–100/2–4½ mm., attenuated upwards or subequal, whitish or pale ochraceous then darker ochraceous or dirty brownish from base up, exposed part pruinose-striate and often fibrous-grooved, rather fragile, narrowly hollow, *lower part buried in sand and paler or white. Flesh* thin, concolorous, drying whitish in centre of cap. *Smell* none. *Spores* ellipsoid or slightly amygdaliform with germ pore, *(10)12–14(15)/7–8(9)* μ (Fig. 244). *Basidia 4-spored. Marginal cystidia* lecythiform, 16–28/7–12 μ, head 3–5 μ, neck 2–3½ μ long (Fig. 398). Cells of cap cuticle pyriform or spheropedunculate 12–25 μ diam. Cystidia on stem in tufts similar to those on gill-edge.

In sand on sand-dunes. Dawlish Warren, 1 Oct. 1951, 17 Nov. 1951 (types in Herb. Kew), 22 Sept. 1952 *et seq.* legit T. J. Wallace; 19 Nov. 1955. *C. tenera* differs in brighter colours, moist cap distinctly striate, and habitat in fields or on soil; *C. semiglobata* differs in colours and habitat in fields. This common sand-dune fungus seems sufficiently constant in its characters to be described as a separate species within the aggregate of *C. tenera*.

Conocybe magnicapitata sp.nov. (Fig. 399)

Pileus 5–14 mm., convexus vel conico-convexus vix expansus, fulvo- vel ochraceo-mellinus, siccitate pallide sordide luteolo-brunneus vel argillaceo-ochraceus, jove pluvio striatus sed mox exstriato siccans. Lamellae adnatae vulgo ventricosae, pallide ochraceae vel mellinae, subdistantes, L 12–17 l 3(7), ad aciem juventute leviter flocculosae. Stipes 20–72/0·5–1·2 mm., subaequalis, vulgo bulbillosus (< 2·5 mm. crassus), supra albido-hyalinus vel pallide mellinus, infra ochraceotinctus mox ferrugineo-fulvus, senectute vulgo totus fulvo-mellinus, pruinoso-striatus. Caro tenuis, concolorata. Odor nullus. Sporae ellipsoideae vel leviter amygdaliformes poro germinativo, 9–11(12)/5–6(7½) μ, vulgo aliquantum crassotunicatae. Basidia 4-sporigera. Cystidia aciei lamellarum lecythiformia, 18–24/10–14 μ capitulo (4)5–7(8) μ lato (Fig. 399). Cystidia stipitis similia.

Ad terram, Gwydyr Forest, Llanwrst, Caernarvonshire, 16 May 1958 (typus in Herb. Kew.). A C. rickeniana item cystidiis magnicapitatis sporis majoribus pileo minus conspicue striato minus expanso differt. C. spicula f. macrospora Kühner (1935) idem censeo.

Cap 5–14 mm., convex or conico-convex *hardly expanding*, tawny-honey or ochraceous-honey drying pale dirty buff or clay-ochraceous, *striate when moist but soon drying matt* and most frequently seen non-striate. *Gills* adnate, usually ventricose, ochraceous or pale honey then rusty-honey, subdistant, L 12–17 l 3(7), edge slightly flocculose when fresh. *Stem* 20–72/0·5–1·2 mm., subequal, often bulbillose (< 2·5 mm. diam.) or swollen at base, hyaline whitish or pale honey above, tinged ochraceous, soon rusty-tawny below, often entirely tawny-honey when old, pruinose-striate. *Flesh* thin, concolorous. *Smell* none. *Spores* ellipsoid or slightly amygdaliform with germ pore, *9–11(12)/5–6(7½)* μ, often rather thick-walled. *Basidia* 4-spored. *Marginal cystidia* lecythiform, 18–24/10–14 μ, *head (4)5–7(8)* μ diam. (Fig. 399). Similar large-headed cystidia on stem.

On soil by path. Gwydyr Forest, Llanwrst, 16 May 1958 (type in Herb. Kew). Differs from *C. rickeniana*, which also has large-headed cystidia, in larger spores and less markedly striate and less readily expanding cap. This is *C. spicula* f. *macrospora* Kühner said by Kühner to grow in woods and in grass.

Conocybe percincta sp.nov. (Figs. 5–8, 245, 400)

Pileus 12–38 mm. e convexo vel conico-convexo expanso-convexus, vulgo leviter umbonatus, pallido-flavidus (ad discum obscuriore flavus) dein mellinus vel umbrinotinctus, jove sicco pallidiore coloratus, jove pluvio exstriatus, senectute interdum ad discum rugulosus, ad marginem raro fragmentis annuli appendiculatis decoratus. Lamellae adnatae, ex albido vel argillaceo argillaceo-mellinae vel -luteolobrunneae postremo ferrugineo-argillaceo-brunneae, confertae, L 34–40 l 3–7, ad aciem manifeste alboflocculoso denticulatae. Stipes 24–45/1½–5 mm., subaequalis vel deorsum incrassatus, pallido-flavidus vel infra umbrinotinctus, infra annulum squamulis albidis vel pallidoflavidis flocculosis obtectus, ad apicem leviter flocculosus vel striatus, magna statura consecuta a lamellis forte striatus, farctus dein anguste cavus; annulus magnus, 6–10 mm. diam., apicalis, postremo mobilis, pallido-luteus, supra flocculosus et striato-plicatus infra haud flocculosus, ad marginem saepe involutus. Caro pilei concolorata, stipitis umbrino-mellina vel ferrugineo-fulva ad basim fere nigrofusca. Odor nullus vel leviter acidulosus. Sporae ellipsoideae vel leviter amygdaliformes poro germinativo, 10–12/5–6 μ. Basidia 2-sporigera, ca. 24–26/7–8 μ. Cystidia aciei lamellarum obtuse cylindrico-clavata, utriformia vel irregulariter fusiformes, 26–40/7–12(16) μ (Fig. 400). Cellulae cuticulae pilei pyriformes vel spheropedunculatae 9–28 μ diam.

In stramento putrido, Wretham Meres, Wretham, Norfolk, 2 Oct. 1958; ad viam in silvo, Covenhope, Herefordshire, 21 Nov. 1959 (typus in Herb. Kew.). A sociis annulo flavido, carne stipitis obscure colorata, cystidiis obtusis et sporis differt.

Cap 12–38 mm., convex or conico-convex then expanded-convex often slightly broadly umbonate, pale yellowish (deeper ochre-yellow at centre) then honey or tinged date-brown, drying paler, not striate when moist, sometimes rugulose at centre when mature, margin occasionally with appendiculate fragments of ring. *Gills* adnate, ± ventricose, whitish or clay-whitish then clay-honey or clay-buff, finally dull ochraceous-honey or rusty clay-buff, crowded L 34–40 l 3–7, edge conspicuously white or whitish flocculose denticulate. *Stem* 24–45/1½–5 mm., subequal or slightly thickened at base, pale yellowish or flushed date-brown or sepia below, *whitish or pale yellowish flocculose-scaly below ring*, apex slightly flocculose-scaly and pale yellowish silky striate, in larger specimens strongly striate from the base of the gills, stuffed then narrowly hollow, base whitish tomentose; *ring large, 6–10 mm.* diam., later movable and often slipping down stem, sometimes breaking up and adhering to cap margin in fragments, pale yellowish, flocculose and striate-plicate above, flocculose-smooth below, edge often inrolled. *Flesh* concolorous in cap, date-brown-honey or rusty-tawny in stem to almost vandyke in stem base. *Smell* none or slightly acidulous. *Spores* ellipsoid or slightly amygdaliform with germ pore, *10–12/5–6* μ (Fig. 245). *Basidia* 2-spored, *ca.* 24–26/7–8 μ. *Marginal cystidia obtuse*, cylindric-clavate, utriform or irregular fusiform, 26–40/7–12(16) μ (Fig. 400). Cells of cap cuticle pyriform or spheropedunculate 9–28 μ diam.

On heap of rotting straw, Wretham Meres, Wretham, 2 Oct. 1958; on soil by road in wood, Covenhope, 21 Nov. 1959 (type in Herb. Kew). Distinguished from its allies by yellowish ring, dark flesh in stem, obtuse marginal cystidia and spore size.

Conocybe rickeniana sp.nov.

Pileus 7–22 mm., e convexo vel convexo-umbonato mox expanso-umbonatus, rariore expanso-conicus, clare fulvo-ochraceus vel ferrugineo-mellinus vulgo ad discum obscuriore coloratus, siccitate ochraceus vel sordide luteolobrunneus, jove pluvio ad discum striatus, jove sicco opacus vulgo ad marginem diu clariore coloratus et striatus. Lamellae adnatae, ± ventricosae, pallido-ochraceae dein aliquantum clare ochraceae postremo ferrugineo-ochraceae vel ferrugineo-mellinae, subconfertae, L 16–20 l 1–3, ad aciem juventute albido-flocculosae. Stipes 25–98/½–2 mm., subaequalis ad basim leviter incrassatus vel bulbillosus (< 3 mm. latus), supra pallide mellinus, infra obscuriore vel ochraceo-mellinus dein vulgo sursum fulvo-mellinus vel ferrugineo-tinctus, juventute totus striatus. Caro concolorata, siccitate intus albida. Odor nullus. Sporae ellipsoideae vel leviter amygdaliformes poro germinativo, 7–9½(10)/4–5 μ, aliquantum tenuitunicatae. Basidia 4-sporigera, ca. 20–26/8–9 μ. Cystidia aciei lamellarum lecythiformia 24–32/11–15(18) μ capitula 5–7½(8) μ lata. Cystidia stipitis magnicapitata similia. Cellulae cuticulae pilei 10–26 μ diam.

In silvis vel magis frequente inter graminos in pratis etc., Dowlands Landslip, Rousdon, Devon, 17 Dec. 1958 (typus in Herb. Kew.). A cystidiis magnicapitatis, pileo jove pluvio forte striato, sporis comparate parvis, habitatione frequenter inter graminos distinguitur.

Cap 7–22 mm., convex or convex-umbonate soon expanded-umbonate, more rarely expanded-conical, *bright tawny-ochre or rusty-honey* often darker at centre, drying ochraceous or pallid-buff, *striate to centre when moist*, matt and opaque when dry, often remaining brighter coloured at margin when drying. *Gills* adnate, ± ventricose, pale ochraceous then rather bright ochre finally rusty-ochre or rusty-honey, fairly crowded, L 16–20 l 1–3, edge whitish flocculose when fresh. *Stem* 25–98/½–2 mm., ± equal with bulbillose or slightly swollen base (< 3 mm. diam.), pale honey above, darker honey or ochraceous-honey below, often becoming *tawny-honey or -rusty from base*, entirely pruinose-striate when fresh. *Flesh* concolorous, drying whitish in centre of cap and stem. *Smell* none. *Spores* ellipsoid or slightly amygdaliform with germ pore *7–9½(10)/4–5* μ, rather thin-walled. *Basidia* 4-spored, *ca.* 20–26/8–9 μ. *Marginal cystidia* lecythiform, 24–32/11–15(18) μ, *head 5–7½(8)* μ diam. Similar large-headed cystidia on stem. Cells of cap cuticle 10–26 μ in diam.

In woods or more frequently in grass on lawns, etc., Mickleham, Surrey, in Norbury Park, 20 Oct. 1950 and Juniper Hill, 24 Oct. 1952; Dowlands Landslip, Rousdon, 17 Dec. 1958 (type in Herb. Kew).

Recognized by large-headed cystidia, moist cap strongly striate, rather small spores and habitat frequently in grass. This is *Conocybe spicula* var. *typica* Kühner (1935), *Galera spicula* (Lasch) Kummer s. Ricken non al., *G. spartea* (Fr.) Kummer s. Wakefield & Dennis (1950) non al. and *G. teneroides* (Peck) Sacc. at least s. J. Lange, but not *Conocybe teneroides* (J. Lange) Kühn. (1935). It was renamed *C. rickeniana* by Singer (*Lilloa*, **22** (1951), 484) but without a Latin diagnosis.

Conocybe subpubescens sp.nov.

Pileus 10–24(44) mm., e convexo vel conico-convexo haud expansus, interdum umbonatus, fulvo-ochraceus vel fulvo-mellinus, siccitate ochraceo-, mellino- vel sordido-luteolobrunneus, jove pluvio striatus, juventute totus minute pubescens. Lamellae adnatae, lineares vel ventricosae, ex albido-ochraceo mellino-luteolobrunneae vel ferrugineo-mellinae, subconfertae, L 20–26(32) l (1)3(7), ad aciem juventute pallidiore minute flocculosae. Stipes 30–90/0·5–2·5 mm., aequalis, ad basim leviter incrassatus vel bulbillosus (< 3(5) mm. diam.), primo albido-ochraceus mox infra ferrugineo-mellinus (vulgo bicoloratus videtur), juventute conspicue pruinoso-striatus et pubescens. Caro tenuis, concolorata. Odor nullus. Sporae ellipsoideae poro germinativo (10)11–13(14)/6–8 μ. Basidia 4-sporigera. Cystidia aciei lamellarum lecythiformia 18–26/7–10 μ capitula (2)3–4½(6) μ lata. Stipes et cellulis similibus capitatis vel non-capitatis et pilis angustibus longis 1–2 μ latis obtectus.

In locis humidis (fossis, etc.), Epsom Common, Surrey, 3 Oct. 1955 (typus in Herb. Kew.). C. pubescens a sporis majoribus habitatione fimicola differt; C. pseudopilosella a sporis majoribus, statura graciliore et habitatione graminicola differt.

Cap 10–24 (specimen on straw heap 44) mm., convex or conico-convex hardly expanding, sometimes umbonate, tawny-ochre or -honey, drying ochraceous-, honey- or pallid-buff, striate when moist, *entirely minutely pubescent when fresh. Gills* adnate, ventricose or linear, whitish ochraceous then honey-buff or rusty-honey, fairly crowded L 20–26(32) l (1)3(7), edge paler and minutely flocculose when fresh. *Stem* 30–90/½–2½ mm., equal with bulbillose or slightly swollen base (< 3(5) mm. diam.), whitish ochraceous at first like gills then soon rusty-honey or reddish amber in lower part, sometimes entirely so when old but often bicoloured, *conspicuously pruinose-striate and pubescent when fresh. Flesh* thin, concolorous. *Smell* none. *Spores* ellipsoid with germ pore, *(10)11–13(14)/6–8* μ. *Basidia* 4-spored. *Marginal cystidia* lecythiform, 18–26/7–10 μ, *head (2)3–4½(6)* μ diam. The stem has similar capitate or non-capitate cystidia as well as long narrow hairs 1–2 μ diam.

In wet woods or damp places. Epsom Common, 3 Oct. 1955 (in rotting leaves in ditch, type in Herb. Kew); Ivybridge, Devon, 31 Aug. 1956 (on very old dung in wet wood); Wretham Meres, Wretham, Norfolk, 2 Oct. 1958 (on old rotten straw). *C. pubescens* has larger spores and is found on dung, *C. pseudopilosella* also has larger spores, but is more slender and grows in grass. This is *C. pubescens* (Gillet) Kühner s. Kühner, 1935, non Gillet, Kühner, 1949; it was renamed *C. subpubescens* by Kühner (*Botaniste*, **34** (1949), 275), but without a Latin diagnosis.

Conocybe utriformis sp.nov. (Figs. 377, 401)

Pileus 13–20 mm., e convexo expanso-convexus, pallido-mellinus vel sordide fulvo-luteolo-brunneus, ad marginem pallidiore coloratus, jove sicco albido-ochraceus, jove pluvio striatus. Lamellae adnatae, pallido-mellinae dein ochraceo-mellinae postremo ferrugineo-mellinae, subdistantes, L 16–20 l (1)3(7), ad aciem albidoflocculosae. Stipes 40–80/1–2 mm. (1½–4 infra), sursum ± attenuatus deorsum leviter bulbosus, ex albo albidus, totus albopruinosus. Caro tenuissima, pilei concolorata, stipitis alba. Sporae ellipsoidae vel leviter amygdaliformes poro germinativo 8–11/4½–5½ μ. Basidia 4-sporigera, ca. 20–24/9–10 μ. Cystidia aciei lamellarum fere utriformia, altera clavata, ad aciem semper obtusa, 32–50/8–12 μ ad apicem 6–12 μ lata (Fig. 401). Cystidia stipitis similia. Cellulae cuticulae pilei pyriformes vel spheropedunculatae 8–26 μ diam.

Ad terram, in fasciculo Caricis remotae, Wheatfen Carr, Surlingham, Norfolk, 18 July 1956 (typus in Herb. Kew.). Stipite alba cystidiis utriformibus et sporis insignis.

Cap 13–20 mm., convex soon expanded-convex, slightly obtusely umbonate, *dull tawny-buff or ochraceous-honey*, slightly paler towards margin, drying whitish ochraceous, *striate* to centre when moist. *Gills* adnate, ± ventricose, pale then darker ochraceous-honey finally rusty-honey, subdistant, L 16–20 l (1)3(7), edge whitish flocculose. *Stem* 40–80/1–2 mm. (1½–4 at base), attenuated upwards with slightly bulbous base, *white then whitish, entirely white pruinose*, base white tomentose. *Flesh* very thin, concolorous in cap, white in stem. No *smell* noticed. *Spores* ellipsoid or slightly amygdaliform with small germ pore, *8–11/4½–5½ μ* (Fig. 371). *Basidia* 4-spored, *ca.* 20–24/9–10 μ. *Marginal cystidia* mostly ± *utriform*, some clavate, apex always obtuse, 32–50/8–12 μ, apex 6–12 μ diam. (Fig. 401). Similar cystidia on stem. Cells of cap cuticle pyriform or spheropedunculate, 8–26 μ diam.

In soil in tuft of *Carex remota*, Wheatfen Carr, Surlingham, 18 July 1956 (type in Herb. Kew). Recognized by white stem, utriform cystidia and spore size.

Conocybe vexans sp.nov. (Figs. 9–10, 246, 402)

Pileus 8–17 mm., e convexo vel conico-convexo expanso-umbonatus, ochraceo-mellinus vel flavido-ochraceus, jove sicco pallide flavido-ochraceus opacus vel subtiliter radialiter rugulosus, jove pluvio exstriatus vel solum ad marginem paululo striatus. Lamellae adnatae, ex albido-argillaceae argillaceo-ochraceae vel -mellinae postremo ferrugineo-mellinae, subconfertae, L 20–22 l 3–7, ad aciem pallidiore flocculosae. Stipes 35–64/1½–3 mm. (a compressu 5), aequalis vel sursum leviter attenuatus vel deorsum incrassatus, vulgo flexuosus, albido-cremeus, pallido-flavidus vel argillaceo-mellinus mox sursum umbrinus vel obscure fuscus, primo totus albido- vel flavido-floccosus dein sericeostriatus, ad apicem persistentiore floccosus, farctus vel anguste cavus; annulus apicalis, albidus vel pallido-flavidus, supra floccoso-striatus, infra subglaber, ad marginem flocculoso-laceratus. Caro pilei concolorata, stipitis deorsum obscure fusca. Odor nullus vel leviter acidulosus. Sporae ellipsoideae vel leviter amygdaliformes poro germinativo 10–12/6–6½ μ (Fig. 246). Basidia 4-sporigera, 28–32/8–9 μ. Cystidia aciei lamellarum fere lageniformia cervice longa saepe curvata vel flexuosa, 22–54/7–12 μ ad apicem 2–4 μ cervice 12–28 μ longa, rariore clavata, 8–10 μ diam. (Fig. 402). Cellulae cuticulae pilei pyriformes vel spheropedunculatae 12–32 μ diam.

Ad terram, Guisachan Forest, Tomich, Inverness-shire, 1 Sept. 1957 (typus in Herb. Kew.). A sociis pileo jove pluvio haud striato sporis et cystidiis insignis.

Cap 8–17 mm., convex or conico-convex then expanded umbonate, ochre-honey or yellowish ochraceous, drying pale yellowish ochraceous, *not or slightly striate at margin only* when moist, matt or finely radially rugulose when dry. *Gills* adnate, ventricose or not, clay-whitish then pale clay-ochraceous to dirty honey finally rusty-honey, subcrowded, L 20–22 l 3–7, edge white or paler flocculose-denticulate. *Stem* 35–64/1½–3 mm. (5 when compressed), equal or slightly attenuated at apex or thickened at base, often flexuose, whitish cream to pale dirty yellowish or clay-honey, *soon discoloured sepia or date-brown from base*, at first entirely whitish or pale yellowish flocculose-pruinose, persistently so at apex but becoming silky striate below ring, stuffed or narrowly hollow; *ring* apical or in upper half, whitish or pale dirty yellowish, flocculose-striate above, smooth or slightly silky below, edge flocculose-lacerate. *Flesh* concolorous, drying pale in cap, sepia or date-brown in lower stem, sometimes brown-horny over gills and in cortex of stem apex. *Smell* none or slightly acidulous; taste slightly rancid-oily. *Spores* ellipsoid or slightly amygdaliform with germ pore, *10–12/6–6½ μ* (Fig. 246). *Basidia 4-spored*, 28–32/8–9 μ. *Marginal cystidia Urtica-hair shaped* or lageniform with rather long sometimes curved or flexuose neck 22–54/7–12 μ, apex 2–4 μ, with a few shorter clavate ones

8–10 μ diam. (Fig. 402). Cells of cap cuticle pyriform or spheropedunculate 12–32 μ diam.

On soil under deciduous trees by roadside (beech). Guisachan Forest, Tomich, 1 Sept. 1957 (type in Herb. Kew), 19 Sept. 1958; on bare soil by path, Dougalston Woods, Dumbartonsh., 10 Sept. 1959 (legit D. A. Reid). Differs from other ringed species of *Conocybe* in non- or scarcely striate moist cap, relatively large spores from 4-spored basidia and rather pointed marginal cystidia. This is *C. togularis* 'forme tétrasporique' Kühner, 1935, and almost certainly *Pholiota togularis* s. Ricken non Fr. etc.

COPRINUS

During 1958 I came across a number of agarics belonging to the section of *Coprinus* which includes *C. narcoticus*. As a result I am describing below two new species (*C. cinereofloccosus* and *C. saccharomyces*) and adding *C. cineratus* (which I have found in various parts of Britain) and *C. radicans* to the 'List'. This section is characterized by a grey floccose-mealy veil on the cap, consisting almost entirely of subglobose minutely warty-punctate cells (Fig. 403), and spores ± ellipsoid amygdaliform, usually with a perisporial sac visible at least when immature.

Key to the 'narcoticus' *group of* Coprinus.

1. Growing on *Carex*, *Scirpus* or *Juncus* debris; spores 12–16(17)/6½–8½ μ; smell none (young cap often remarkably elongate, < 22 mm. high) *martinii*
1. Not this combination of characters **2**
  2. Smell strong, unpleasant or of yeast **3**
  2. Smell none or faint fungussy **5**
3. Smell of wet yeast; basidia 2-spored; spores 14–20/8–10 μ (Fig. 250); growing on the ground *saccharomyces*
3. Smell strong unpleasant, almost stercoraceous; basidia 4-spored; spores smaller **4**
  4. Spores 12–15/7–8 μ; stem often rooting or joined by mycelial cord to the stems of other fruit-bodies (an occasional single specimen may have a barely rooting stem); growing on rotting vegetable matter *radicans*
  4. Spores 10–13/5–6 μ; stem not or only slightly rooting; growing on the ground *narcoticus*
5. Spores 11–13(15)/5½–7 μ (7–8½ μ, with perisporal sac, Fig. 247) *cinereofloccosus*
5. Spores smaller (within the range of 7–11/4–7 μ) **6**
  6. Growing on dung **7**
  6. Growing on soil; spores 9–11(12)/5½–7(8) μ *cineratus*
7. Spores 9–11/5½–7 μ *stercorarius* s. Ricken, J. Lange
7. Spores 7–8/4–4½ μ (*stercorarius* s. Kühner & Romagnesi, not yet recorded in Britain)

In view of the similarity of spore size it remains to be seen whether *cineratus* and *stercorarius* s. Ricken, J. Lange are really distinct.

Coprinus cinereofloccosus sp.nov. (Figs. 247, 403, 404)

Pileus primo glandiformis vel ellipticus 11–22 mm. altus/8–20 mm. latus dein expanso 10–38 mm., pallido- vel argillaceo-griseus, interdum ad discum obscuriore coloratus, primo totus pallido-griseo farinosus, vulgo ad discum squamis farinosis crassioribus interdum sordide ochraceo-tinctis obtectus, interdum postremo radialiter plicato-sulcatus margine fissurato revolutoque. Lamellae fere liberae, ex albo albidae dein nigrae, confertae, ad aciem primo alboflocculosae. Stipes primo 25–50/2–4 mm. postremo 50–100(150)/2–6 mm., subaequalis vel sursum attenuatus, albus vel pallido-griseus, totus albo- vel griseo-farinoso-pruinosus, cavus, ad basim obscuriore farinoso, interdum mycelio radicato. Caro tenuis, grisea. Odor nullus. Sporae ellipsoideae-amygdaliformes a perisporio tenuiter tunicatae, 11–13(15)/5½–7 μ, cum perisporio 7–8½ μ (Fig. 247). Basidia 4-sporigera. Cystidia aciei lamellarum spheropedunculata, pyriformia vel irregulariter vesiculosa, 40–100/20–45 μ. Cystidia faciei lamellarum cylindrico-vesiculosae vel elongato-fusiformes, 86–170/24–36 μ. Cellulae veli pilei globosae vel ellipsoideae verruculoso-punctatae, 24–88 μ latae (Fig. 403), simul paucis ± cylindricis ca. 60–70/6–14 μ. Cellulae veli ad basim stipitis globosae sed etiam vesiculosae interdum 1–2-diverticulatae, 46–150/20–48 μ (Fig. 404).

Inter graminos in pratulo, The Manor, Rothamsted, Herts, 8 Nov. 1958 (typus in Herb. Kew.); in solo, Bottom Wood, Mapledurham, Berks, 1 Nov. 1958; in solo cinerato, Rothamsted, Herts, 18 April 1953 (legit Miss M. Holden). A C. cinerato sporis majoribus, pileo crassiore farinoso differt.

Cap at first ellipsoid or acorn-shaped 11–22 mm. high/8–20 mm. broad, then expanded ± plane 10–38 mm., pale greyish or grey-clay, sometimes darker grey in centre, *entirely grey floccose-mealy at first* often with *denser mealy-floccose scales at centre* which are sometimes tinged dirty ochraceous, later more scattered floccose-mealy and sometimes becoming radially plicate-sulcate, margin splitting radially and becoming revolute. *Gills* free or very narrowly adnate, white, soon whitish, then black, ± lanceolate, crowded, edge white flocculose at first. *Stem* 25–50/2–4 mm. before cap expands then 50–100(150)/2–6 mm., ± equal or attenuated at apex, white or whitish to pale grey, entirely white or pale grey mealy-pruinose or silky, hollow, base with darker denser meal as on cap sometimes also with thick mycelial strand. *Flesh* thin except at cap centre, greyish, hyaline-grey in stem. *Smell* none. *Spores* ellipsoid-amygdaliform with rather thin perisporial sac, *11–13(15)/5½–7* μ, with perispore 7–8½ μ (Fig. 247). *Basidia* 4-spored. *Marginal cystidia* spheropedunculate, pyriform or irregularly vesiculose, 40–100/20–45 μ. *Facial cystidia* cylindric-vesiculose or elongate fusiform, 86–170/24–36 μ. Cells of veil on cap globose or ellipsoid, minutely warty-punctate, 24–88 μ diam. (Fig. 403) with a few cylindric or cylindric-fusiform cells *ca.* 60–70/6–14 μ in amongst. Cells of veil at base of stem with globose cells as on cap but *also some bladder-shaped ones* 46–150/20–48 μ a few of which may be 1–2-diverticulate (Fig. 404).

In grass on lawn, The Manor, Rothamsted, 8 Nov. 1958 (type in Herb. Kew); on soil, Bottom Wood, Mapledurham, 1 Nov. 1958; on ashy soil on allotment, Rothamsted, 18 Apr. 1953 (legit Miss M. Holden). Differs from *C. cineratus* in larger spores, more coarsely mealy cap and perhaps presence of bladder-shaped cells at the base of the stem. *C. narcoticus* and *C. radicans* are both easily distinguished by being strong-smelling agarics (see key, p. 198).

Coprinus ellisii sp.nov. (Figs. 11, 248, 405, 406)

Pileus primo glandiformis vel cylindrico-ovoideus 6–20 mm. altus/6–20 mm. latus dein expansus 10–40 mm., pallido-ochraceus ad discum vulgo obscuriore ochraceus vel ochraceo-brunneus, primo totus albido-floccosus sed etiam ad discum squamis ochraceis vel umbrinis fibrilloso-pilosis vulgo acuminatis variegatus, ad marginem postremo striatus vel sulcatus et radialiter fissuratus vel revolutus. Lamellae ± liberae, ex albo pallido-cacainae vel umbrinae postremo nigricantes, confertae, ad aciem primo albo-flocculosae. Stipes primo 10–20/1–3½ mm. (ad basim 3–7 mm.) postremo 40–55 mm. longus, sursum attenuatus, albus vel praecipue ad basim ochraceo-tinctus, primo minute pruinosus dein vulgo fere glaber, cavus, ad basim vulgo incrassatus et tomentoso-velatus sicut volvatus. Caro tenuissima. Odor nullus. Sporae in cumulo umbrinae, cylindrico-phaseoliformes, 6–8½/3–3¾ μ (Fig. 248), pallide brunneolae sub micr. Cystidia aciei lamellarum ellipsoidea vel vesiculoso-clavata, 16–50/10–30 μ. Cystidia faciei lamellarum ellipsoideo-vesiculosa, 60–84(122)/28–42 μ. Cellulae veli pilei (1) ± globosae, laeves, hyalinae 20–60 μ diam.; (2) cylindrico-ellipsoideae vel fusiformes, seriatae, ultimae ± lageniformes vel ad apicem angustiores, crasso-tunicatae, tunicis flavido-brunneis vel rariore hyalinis sub micr., granuloso-punctatae vel laeves, 20–80/4–28 μ (Fig. 406).

Ad terram in foliis putridis, Osier Carr, Surlingham, Norfolk, 9 July 1958 (legit E. A. Ellis; typus in Herb. Kew.); ad ramulum Fagi, Polesden Lacey, Surrey, 3 Oct. 1954. A C. domestico et sociis sporis minoribus angustioribus et stipite ad basim vulgo a velo sicut volvato differt.

Cap at first cylindric-ovoid or acorn-shaped 6–20/6–20 mm. then expanded 10–40 mm., *pale ochraceous often with darker ochraceous or ochraceous-brownish centre*, entirely whitish floccose at first with in addition *minutely fibrillose-pilose often pointed ochraceous or date-brown scales at and round the centre* (up to 1/3rd out), margin becoming striate or sulcate and revolute or radially split as the cap expands. *Gills* ± free, white then pale chocolate or umber finally blackish, crowded, lanceolate, edge white flocculose at first. *Stem* at first 10–20/1–3½ mm. (3–7 at base) then 40–55 mm. long when cap has expanded, attenuated upwards, white or whitish or tinged ochraceous especially at base, minutely pruinose or downy then often ± smooth, hollow, *base often swollen and with volva-like tomentum or covering from veil* (like that at cap centre), sometimes with a distinct reflexed edge, tomentose or velvety-strigose at extreme base. *Flesh* very thin. *Smell* none. *Spores* umber or sepia-vandyke in mass, cylindric-phaseoliform, rather pale sub micr. (daylight in H_2O), *6–8½/3–3¾* μ (Fig. 248). *Marginal cystidia* subglobose, ellipsoid or vesiculose-clavate, 16–50/10–30 μ. *Facial cystidia* ellipsoid-vesiculose, 60–84(122)/28–42 μ. Cells of veil on cap (1) ± globose, smooth, hyaline, 20–60 μ diam.; (2) chains of cylindric-ellipsoid or fusiform cells, end cell often rather lageniform or with narrower apex, thick-walled, walls yellowish brown or more rarely hyaline sub micr., encrusted- or granular-punctate or smooth, 20–80/4–28 μ (Fig. 406).

On ground in rotting leaves, Osier Carr, Surlingham, 9 July 1958 (legit E. A. Ellis, type in Herb. Kew); attached to beech twig, Polesden Lacey, 3 Oct. 1954. Distinguished from *C. domesticus* and its allies by shorter narrower cylindric-phaseoliform spores and veil often appearing volvate at stem base; named after the Norfolk naturalist and mycologist who collected this and who has brought me many puzzling and apparently undescribed agarics.

Key to the 'domesticus' *group of* Coprinus

Those with veil consisting of (1) ± globose hyaline smooth cells (Fig. 405), and (2) chains of thick-walled cylindric-ellipsoid or fusiform cells often with walls brownish sub micr. and *either* encrusted or granular-punctate *or* smooth (Fig. 406).

1. Spores 6–8½/3–3¾ μ (Fig. 248), cylindric-phaseoliform; stem base often with volva-like remains of veil *ellisii*

1. Spores broader or longer; stem base sometimes swollen but without volva-like remains of veil **2**
 2. Spores cylindric-phaseoliform, 7–10/3½–5 μ *domesticus*
 2. Spores broader **3**
3. Spores ellipsoid-ovoid or slightly amygdaliform, barely phaseoliform in any view, 7½–10/4¾–5¾ μ; thick-walled cells of veil sparsely granular-punctate; cap often paler *xanthothrix*
3. Spores ellipsoid-phaseoliform, 8–11½/5–6½ μ; thick-walled cells of veil often strongly encrusted-pigmented; cap often darker *radians*

Coprinus martinii sp.nov.

Pileus primo ovoideo-cylindricus vulgo elongatus, 5–22 mm. altus/3–8 mm. latus, dein expanso-umbonatus margine revoluto 8–15 mm., cinereo-griseus, primo totus farinaceo-granulosus dein ad partem externam glabrescens et sulcatus. Lamellae liberae, e griseo nigrae, confertae, ad aciem primo atomato-flocculosae. Stipes 32–60/1½–2 mm. (ad basim < 5) ad basim incrassatus vel sursum attenuatus, pallido-griseus dein infra obscuriore griseus, hyalinus, primo minute sericeo-fibrillosus dein glabrescens, ad basim tomentosus. Caro hyalina, alba, ad basim stipitis grisea. Odor nullus. Sporae ellipsoideo-amygdaliformae poro germinativo, a perisporio tunicatae, laeves, 12–16(17)/6½–8½ μ. Cystidia 'aciei et faciei lamellarum cylindrico-fusiformia vel elongato-ovata, copiosa, < 115 μ longa' sec Favre. Cellulae veli pilei globosae vel vesiculosae, minute granuloso-punctatae, 24–52 μ latae.

Ad stipulas Caricis, Scirporum, Juncorum. Ad stipulas Scirpi caespitosi, Sheffield, Yorks, 9 Oct. 1954 (legit D. A. Reid, typus in Herb. Kew.); Shieldaig, Wester Ross, 2 June 1947 (legit R. W. G. Dennis); ad stipulas Junci subnodulosi, Parish Marsh, Surlingham, Norfolk, 26 May 1947 (legit R. W. G. Dennis). C. cinerato et C. narcotico affinis, sed a sporis magnis ellipsoideo-amygdaliformibus, habitatione, absentia odoris facile distinguitur.

Cap at first ovoid-cylindrical often elongate, 5–22 mm. high/3–8 mm. broad, then expanded umbonate with revolute margin 8–15 mm., ash-grey, *mealy-pulverulent* becoming smooth and sulcate in outer part as cap expands. *Gills* free, grey then black, crowded, edge atomate-flocculose at first. *Stem* 32–60/1½–2 mm. (< 5 at base), ± thickened at base or attenuated upwards, pale grey, darker grey below when old, hyaline, minutely silky-fibrillose at first then smooth, base tomentose. *Flesh* hyaline white above, hyaline grey below. *Smell* none. *Spores 12–16(17)/6½–8½* μ, ellipsoid-amygdaliform with germ pore, smooth but with perisporial sac. *Marginal* and *facial cystidia* 'abundant, cylindric-fusiform or elongate-oval, < 115 μ long' sec Favre. Cells of veil on cap globose or vesiculose, minutely granular-punctate, 24–52 μ diam.

On *Carex*, *Scirpus* and *Juncus* debris. On *Scirpus caespitosus*, Sheffield, 9 Oct. 1954 (legit D. A. Reid, type in Herb. Kew); Shieldaig, 2 June 1947 (legit R. W. G. Dennis); on *Juncus subnodulosus*, Parish Marsh, Surlingham, 26 May 1947 (legit R. W. G. Dennis). Related to *C. cineratus* and *C. narcoticus* but easily distinguished by large ellipsoid-amygdaliform spores, lack of smell and habitat. This is *C. martinii*, first described by Favre (*Bull. Soc. mycol. Fr.* **53** (1937), 286), but without a Latin diagnosis (see key, p. 198).

Coprinus saccharomyces sp.nov. (Figs. 12, 250)

Pileus primo ovoideus vel glandiformis, 7–12 mm. altus/5–7 mm. latus, dein expansus ad discum obtuse umbonatus 16–20 mm., totus pallido-griseo granuloso-floccosus, ad discum vulgo crassiore sordide ochraceo- vel brunneo-floccosus, ad marginem postremo recurvatus et radialiter fissuratus. Lamellae liberae, ex albo nigricantes, haud confertae, interdum primo latae, ad aciem primo albo-granulosae vel -floccosae. Stipes 24–40/1–2 mm., aequalis, albidus interdum sordide brunneotinctus, primo totus albido vel pallido-griseo granuloso-floccosus postremo glabrescens, solidus. Caro tenuissima. Odor Saccharomycetis, fracta vel inclusione fortiore olet. Sporae ellipsoideae leviter amygdaliformes, a perisporio aliquantum indistincte tunicatae, (14)15–19(20)/9–10 μ (Fig. 250). Basidia 2-sporigera, ca. 36–38/9–10 μ. Cystidia aciei lamellarum spheropedunculatae vel clavatae, 42–90/14–44 μ. Cystidia faciei lamellarum elongato-fusiformia vel -ellipsoidea, 64–105/20–32 μ. Cellulae veli pilei globosae vel ellipsoideae vel pyriforme-vesiculosae, verruculoso-punctatae, haud raro brunneo-incrustatae, 24–60 μ latae, simul infra eis cellulis paucis cylindricis angustis.

In solo inter graminos, Carnwath, Lanarkshire, 28 Sept. 1958 (typus in Herb. Kew.). A C. narcotico et sociis basidiis bisporigeris sporis majoribus et odore Saccharomycetis differt.

Cap at first ovoid or acorn-shaped, 7–12 mm. high/5–7 mm. broad then expanded obtusely umbonate 16–20 mm., *entirely pale grey mealy-floccose, flocci at centre often slightly coarser and tinged dirty ochraceous or pale sepia*, margin becoming recurved and radially split. *Gills* free, white, soon blackish, then black, not crowded, sometimes broad at first, edge white mealy-flocculose at first. *Stem* 24–40/1–2 mm., ± equal, hyaline grey or whitish, sometimes tinged dirty brownish, entirely whitish or pale grey mealy-floccose at first then ± smooth or silky-flocculose, solid. *Flesh* very thin, grey or blackish grey in cap centre, pale grey or tinged dirty brownish in centre of stem. *Smell of wet yeast*, stronger after being cut or enclosed in a tin. *Spores* ellipsoid slightly amygdaliform, with perisporial sac best seen on immature spores, often none or indistinct on mature spores *(14)15–19(20)/9–10* μ (Fig. 250). *Basidia 2-spored, ca.* 36–38/9–10 μ. *Marginal cystidia* spheropedunculate or clavate often with long stalk, 42–90/14–44 μ. *Facial cystidia* elongate-fusiform or ellipsoid, 64–105/20–32 μ. Cells of veil on cap globose, ellipsoid or pyriform-bladder-shaped, warty-punctate, some brownish encrusted-pigmented, 24–60 μ diam., with a few narrow cylindrical hyaline cells at the base of these.

On soil in grass, Carnwath, 28 Sept. 1958 (type in Herb. Kew). Differs from others of the '*narcoticus*' group in 2-spored basidia, large spores and yeast-like smell (see key, p. 198).

CORTINARIUS (MYXACIUM) *EMUNCTUS* Fr. and *C.* (M.) *EPIPOLEUS* Fr.

R. Henry (*Bull. Soc. mycol. Fr.* **66** (1950), 149) described a fungus as *C. epipoleus* but I do not think it that of Fries. The two chief diagnostic features of *C. epipoleus* as described by Fries are (1) 'pileus...glaber quidem, sed *rore peculiari cano innato*, quasi sericeus et canosericeus, opacus', and (2) 'lamellae *decurrentes*, subdistantes...in omnia aetate *cinnamomeae*'. There is no mention of hoariness in R. Henry's description and the gills are stated to be 'argillacées, beige ocrées, puis isabelle-argillacées, enfin ocracées-rouillées'. This description seems to me to fit *C. emunctus* s. Fries, which I take it to be, and also my own finds described below. R. Henry has himself described a fungus as *C. emunctus* s. Quél., which he states not to be that of Fries, and which therefore cannot bear the epithet *emunctus*. R. Henry also states that *C. liquidus* s. Fries, 1884 (*Icones Selectae*, Pl. 149²) is the same as his *C. epipoleus*, but not *C. liquidus* s. Fries, 1838. If this is so, it is incorrect to state that *C. epipoleus* = *C. liquidus*, and the statement should be amended to *C. epipoleus* s. R. Henry = *C. liquidus* s. Fries, 1884, non Fries, 1838. I confidently copied this error in *Cortinarius* I, but am taking this opportunity to correct it. I still accept *C. epipoleus* s. Rea as being that of Fries, but I have not collected this fungus myself and further field work is necessary to verify it.

There is no evidence of *C. emunctus* s. R. Henry in Britain, but we have a fungus which I believe to be *C. emunctus* s. Fries, as it agrees with Fries's original description except for a slight lilac tinge to the young gills, which, however, could easily be missed.

CORTINARIUS (MYXACIUM) *EMUNCTUS* Fr. s. Fr. non Quél., R. Henry (nec A. H. Smith)

Cap 18–34 mm., convex then expanded obtusely umbonate, *pale grey-blue-violaceous fading to pale creamy-ochraceous* at centre and pale grey-lilac round margin, almost entirely whitish or creamy-ochraceous when old, glutinous and smooth. *Gills* adnate with tooth, when young and fresh sometimes pale lilac especially near cap margin, then pale ochraceous or dirty ochraceous finally ochraceous-honey, fairly crowded, L *ca.* 28–34 l 3; edge paler but sometimes retaining lilac tinge in places, uneven. *Stem* 45–70/4–7 mm. (5–12 at base), clavate or slightly thickened near base, whitish above cortinal zone, *blue-violaceous or grey-violaceous below fading to pale lilac or greyish violaceous then whitish, base becoming creamy or ochraceous*, viscid below cortinal zone, soft. *Flesh* grey-blue-violaceous in stem apex, creamy ochraceous or whitish in cap and lower stem, almost unicolorous pale dirty ochraceous when old. *Smell* and *taste* none. *Spores subglobose or broadly ovoid*, 7–8(9)/6–6½ μ. *Basidia* 4-spored, 34–38/10–11 μ. *Gill edge* fertile.

In moss under birches, Lochan Mhor, Rothiemurchus, Inverness-shire, 14 and 15 Sept. 1957. Readily recognized by peculiar colour changes and small subglobose spores. *C. epipoleus* s. Fries, Rea is differently coloured and the cap is innately silky-hoary when dry. *C. salor* is a brighter blue at first and has larger spores. The following features from the original diagnosis of *C. emunctus* (*Epicrisis* (1838), p. 275) seem particularly applicable to the fungus described above. 'Color tam pilei, quam stipitis e dilute violaceo griseus. Stipes 2–3 unc. longus, 3–4 lin. crassus, intus spongiosus. Pileus obsolete gibbus, 1–2 unc. latus, demum griseo-alutaceus opacus, margine declivi, carne ubique tenui molli albida.' The gill-characters ('lamellis adnatis subdistantibus latis ex argillaceo aquose cinnamomeis') are slightly less in agreement, but allowing for variation in shape, which is rarely diagnostic, do not differ sufficiently to justify rejection of the epithet *emunctus* for my fungus.

Cortinarius (*Myxacium*) **pinicola** sp.nov.

Pileus 38–100 mm., e convexo expansus obtuse vel late umbonatus, ochraceus vel fulvo-ochraceus, vulgo ad marginem pallidiore coloratus, interdum juventute castaneus vel obscure brunneus, senectute pallescens, jove pluvio glutino hyalino vel pallido-ochraceo oblinitus, jove sicco ad marginem leviter vel distinctiore radialiter plicato-striatus. Lamellae adnatae vel fere liberae, interdum dente decurrentes, ex albido argillaceae vel argillaceo-ochraceae, postremo ferrugineo-ochraceus, subconfertae, L 40–60 l 1–3, ad aciem albo-flocculosae. Stipes 50–150(170)/7–16 mm., vulgo leviter ventricosus et deorsum attenuatus, rariore subaequalis, ex albo vel albido praecipue ad apicem ochraceotinctus, supra zonam cortinae albo-sericeo striatus, infra e velo viscido squamulis parvis albofloccosis obtectus, saepe senectute transversim squamoso-diffractus, mox mollis; zona veli juventute raro levissime griseo-caerulea. Caro pilei albida, stipitis ochraceotincta, infra in corticem interdum obscuriore colorata. Odor nullus. Sporae limoniformes, asperae, 11–15(17)/6½–8(9) μ. Cellulae aciei lamellarum clavatae vel pyriformes, 20–44/10–24(30) μ.

Semper in pinetis (Pinus sylvestris). Pollanbuidhe, Glen Affric, Inverness-shire, 21 Aug. 1955 (typus in Herb. Kew.). C. collinitus a coloribus clarioribus, absentia cellularum sterilium ad aciem lamellarum, C. pseudosalor velo ad stipitem zonam glabram formante et coloribus partim vulgo caeruleo-violaceis differunt.

Cap 38–100 mm., convex then expanded, obtusely or broadly umbonate, *ochraceous-buff to tawny-ochraceous* (almost colour of *Amanita fulva*), generally paler at margin, sometimes chestnut or dark vandyke when young, paler when old, smooth and covered with hyaline or pale ochraceous gluten when moist, slightly to distinctly radially wrinkled striate round the smooth or slightly rugulose centre when dry. *Gills* adnate to almost free, sometimes with tooth, *whitish then clay or pale clay-buff*, finally ochraceous-buff or rusty-ochraceous, fairly crowded, L 40–60 l 1–3, edge white flocculose often conspicuously so. *Stem* 50–150(170)/7–16 mm., usually slightly ventricose in middle and attenuated at base, sometimes ± equal (especially when growing in deep heather), *white or whitish then tinged ochraceous or yellowish buff*, more especially at apex, white silky striate above cortinal zone, *viscid veil forming small white-floccose scales below this*, surface sometimes breaking up into bands or patches when old, solid, soon soft; when young the floccose veil-zone may appear very faintly bluish grey. *Flesh* whitish in cap, tinged ochraceous-buff in stem, sometimes darker in places, especially in lower part of cortex. *Smell* none. *Spores* limoniform, rough, 11–15(17)/6½–8(9) μ. *Basidia* 4-spored. *Gill edge sterile*, cells clavate or pyriform, 20–44/10–24(30) μ.

Always under pines (*Pinus sylvestris*). Black Wood, Rannoch, Perthshire, 3 Sept. 1953; Pollanbuidhe, Glen Affric, 21 Aug. 1955 (type in Herb. Kew); Plodda Falls, Guisachan, 22 Aug. 1955, Loch-an-Eilean, Rothiemurchus, both Inverness-shire, 26 Aug. 1955; Beinn Eighe Reserve, Kinlochewe, Wester Ross, 27 Sept. 1955 (legit D. M. Henderson), and several other records from these areas, all of which are places where *P. sylvestris* is or is suspected to be native.

It is with some diffidence that I describe this fungus as a new species, but it does not seem to fit any description I have been able to find: perhaps it is peculiar to northern *P. sylvestris* woods. I think it may be *C. mucifluus* in the original sense of Fries (1838) or at least its main component. *C. pseudosalor* grows in the same pine woods so that I have been able to compare them in the field. This fungus differs from *C. pseudosalor* in the white floccose-scaly veil-zone on the stem, the scales being small and set rather closely, and almost complete lack of blue-violaceous colours. The conspicuously sterile gill edge distinguishes it from *C. collinitus*, which is perhaps slightly brighter in colour and has coarser scales on the stem. Since this fungus seems to combine the characters of the subsections Nudi and Cystidiosi introduced by me in *Cortinarius* 1 (1955) I propose to abandon these in future works. This is the fungus referred to on p. 76 of that work under *mucifluus* which I stated erroneously to be without conspicuous sterile cells on the gill edge.

CORTINARIUS (MYXACIUM) *PSEUDOSALOR* J. Lange, *Flora Agaricina Danica*, v (1940), p. iii

= *C. elatior* f. *mucifluoides* R. Henry, *Rev. Mycol., Paris*, **10** (1945), Suppl., 14 (nom. nud.); = *C. mucifluoides* (R. Henry) R. Henry, *Bull. Soc. mycol. Fr.* **66** (1950), 156 (nom. nud.); = *C. mucifluus* Fr. s. Ricken (sub nom.gen. *Myxacium*), Konrad & Maublanc vix Fr.

Cap 30–110 mm., convex or conico-convex then expanded often broadly umbonate, *variable in colour*, most commonly olivaceous or dirty buff with darker smoky brown or umber centre, sometimes paler (ochraceous-yellowish with reddish brown or tawny-tinged centre), *margin sometimes tinged violaceous at first*, glutinous and with smooth margin when moist, margin often but not always drying strongly wrinkled striate. *Gills* adnate or adnato-decurrent, ventricose or not, sometimes with pale violaceous tinge when quite young (in bud) but *soon pale ochraceous-clay, then dirty buff or ochraceous-clay*, finally rusty-ochraceous, fairly crowded L *ca.* 50–80 l 1–3, sometimes veined on sides or interveined (especially in larger specimens), edge even or uneven, often paler and whitish flocculose. *Stem* 45–100/7–22 mm., equal with ± pointed base or slightly ventricose, or attenuated downwards, white or pale blue-violaceous above, *usually deeper purplish or blue-violaceous below cortinal zone*, less commonly entirely without blue-violaceous tints, apex silky striate, *viscid and smooth* from veil below cortinal zone, becoming silky-smooth when dry, but surface sometimes cracking in places usually near base and into rather broad ± concentric patches. Veil glutinous, often bluish at first, *leaving smooth zone* on stem when fresh. *Flesh* white or whitish, sometimes tinged blue-violaceous in upper stem when young, or later dirty yellowish under cap cuticle or in stem base. *Smell* and *taste* none. *Spores* amygdaliform or limoniform, rough, 12–16(17)/7–9 μ. *Basidia* 4-spored. *Gill edge sterile*, cells spheropedunculate or clavate, *ca.* 20–60/10–30 μ. Very common in deciduous and coniferous woods.

I originally described this agaric as *C. mucifluus* s. Ricken, Konrad & Maublanc and also as *C. pseudosalor* (*Cortinarius* 1, *Naturalist*, July–Sept. 1955, p. 22), but now think it better to combine these two descriptions into one and to abandon the epithet *mucifluus* as a nomen confusum. I have therefore used the earliest valid epithet for this fungus, namely, *pseudosalor* (J. Lange, 1940). *C. mucifluoides* (for which R. Henry has given *pseudosalor* as a synonym) was originally published as *C. elatior* f. *mucifluoides* R. Henry

(1945) and then raised by him to specific rank (1950), but without a Latin diagnosis on either occasion.

My reason for the rejection of the epithet *mucifluus* for this fungus is that Fries originally described no blue-violaceous colours for the cap ('livido-argillaceus') and says of the stem 'albus leviter caerulescens' and 'e velo fugaci floccoso-squamuloso'; the fact that Fries illustrated what was probably another fungus in *Icones Selectae* (1884) has no taxonomic bearing on this question.

I find the colours and colour changes of this agaric so variable after further field work that I do not think there is any ground for separating *mucifluus* and *mucifluoides* on colours alone. Neither is size any criterion. To me the important diagnostic features of *pseudosalor* are (1) the veil forms a smooth zone on the stem when young and fresh, though the surface may crack with age; (2) the frequent blue-violaceous colours, especially of the middle part of the stem, combined with pale hardly blue-tinged gills; and (3) well-marked sterile cells on gill edge. *C. elatior* I regard as different because the gills are consistently darker ('semper obscurae etiam violaceo-brunneae' sec Fries, 1838). *C. pinicola* (described below) is not blue-violaceous in any part (except rarely a very slight tinge on the young stem) and the veil forms a white floccose-scaly viscid zone on the stem, the scales being small and rather closely set. *C. stillatitius* s. Bresadola is left in the 'List' for the moment on account of the more distinctly blue gills and veil, but further field work is required to determine whether this is a good species. I do not think that the wrinkling of the cap margin in these agarics is a good diagnostic character; it is surely a drying phenomenon associated with thickness of flesh; nor are the intervenation of the gills or the size and shape of the fruit body diagnostic, but simply variable characters within the species.

Cortinarius (*Phlegmacium*) **amoenolens** sp.nov.

Pileus 27–130 mm., e convexo expansus vulgo late obtuse umbonatus, pallide stramineo-luteus vel ochraceus rariore leviter olivaceotinctus, viscidus, vulgo e velo albido squamis adpressis praecipue juxta marginem variegatus, ad marginem primo involutus et residuis cortinae et veli decoratus. Lamellae adnatae interdum emarginatae, e caeruleo-griseo-argillaceo argillaceae vel ochraceo-argillaceae, postremo dilute coffeatae (numquam vere ferrugineae vel cacainae), confertae, ad aciem vulgo leviter inaequales. Stipes 45–140/8–22 mm. (ad basim 18–45 in diam.) ± aequalis bulbo tereti-marginato raro immarginato, primo caeruleo-violaceus mox albus vel albidus dein praecipue basim versus luteolotinctus, ad bulbum residuis luteolis vel ochraceis veli maculatus, infra bulbum albo-tomentosus interdum mycelio radicibus filiformibus terminatus; cortina caerulea vel albida. Caro pallide caerulea vel albida, vulgo ad apicem stipitis obscuriore caeruleo-violacea, sub cuticula pilei et in bulbo lutescens, saepe juxta lamellas colore cornus tincta. Odor distinctus vel fere debilis, primo gratus pruniodorus, senectute fere graveolens. Sapor carnis mitis, cuticula pilei acris. Sporae limoniformes, verrucoso-asperae, (9) 10–13/6–7 μ. Cellulae steriles ad aciem lamellarum 4–8 μ latae. Caro +NaOH ± immutabilis; cuticula pilei +NaOH leviter rufo-brunneotincta interdum dein aurantiobrunnea.

In fagetis (praecipue in solo calcareo). Bradenham, Bucks, 16 Sept. 1945 (legit R. W. G. Dennis & E. M. Wakefield, typus in Herb. Kew.); Mickleham Downs, Surrey, 12 Oct. 1952; Norbury Park, Surrey, 14 Oct. 1953; Polesden Lacey, Surrey, 23 Oct. 1953; Stoke Row, Berks., 24 Oct. 1953. Bulbo tereti e velo maculato, cuticula pilei acre, odore pruniodoro et sporis insignis. C. cyanopus a lamellis senectute fere cacainis, odore fere nullo, sapore totus mite, bulbo sine residuis veli differt.

For description in English see *Cortinarius* I (p. 42); recognized by patches of veil on rounded marginate bulb, bitter cap cuticle, faint but distinct fruity smell (not, however, perceptible by all) and rough limoniform spores. One of the commoner Phlegmacia in beech woods in Britain, at least in south-east England. This is *C. cyanopus* s. J. Lange, R. Henry, 1936, Kühner & Romagnesi non Fries, Ricken, Konrad & Maublanc, Moser, also *C. glaucopus* s. Rea non auct., which was renamed *C. amoenolens* by R. Henry (*Rev. Mycol., Paris*, **8** (1943), Suppl., 13), but without a Latin diagnosis.

Cortinarius (*Phlegmacium*) **balteatocumatilis** sp.nov. (Fig. 252)

Pileus 50–150 mm., e convexo expansus, rufobrunneus, vinaceorufus vel umbrinus interdum fulvo- vel violaceo-tinctus, ad marginem zona anguste clare violacea ornatus, jove pluvio viscidus, jove sicco glabro-nitidus, ad marginem diu incurvatus, ± innato-fibrillosus, cuticula facile separabili. Lamellae adnatae, fere lineares, e pallido-argillaceo pallide argillaceo-brunneae vel -ochraceae, confertae, ad aciem pallidiore coloratae ± inaequales. Stipes 50–70/18–30 mm., clavatus vel clavato-bulbosus, albus vel albidus dein sursum ferruginascens, interdum hac atque illac violaceotinctus, juventute e velo violaceo fugace praecipue infra sparse maculatus, ad apicem albopruinosus, ad basim albotomentosus. Caro alba vel albida, sub cuticula leviter violaceotincta, dura, ad discum crassa. Odor fere fortis, graveolens. Sapor mitis. Spora eellipsoideo-amygdaliformae vel amygdaliformae, leviter punctatae, (10)10½–12½(13)/5½–6½ μ (Fig. 252). Cellulae steriles ad aciem lamellarum 6–8 μ latae. Caro + NaOH ± immutabilis; caro + NH_4OH ochraceobrunnea flavo-marginata.

In silvis deciduis. In betuletis Lochan Mhor, Rothiemurchus, Inverness-shire, 14 Sept. 1957 (typus in Herb. Kew.); C. cumatilis a pileo primo fere totus violaceo- vel cyaneo-tincto, sporis ellipsoideo-fusiformibus, odore nullo vel debile, C. balteatus a pileo magis sicco ± velutino-fibrilloso non nitido, absentia veli violacei differunt.

For description in English see *Cortinarius* I (p. 62); differs from *C. cumatilis* in restriction of violet colour in cap to margin, in smell and spores, and from *C. balteatus* in more viscid shiny-smooth cap and the violaceous veil. *C. violaceocinctus* has the veil in part pale blue-violaceous, but differs in lack of blue-violaceous colours on cap and has smaller spores (Fig. 253). This is *C. balteatus* s. Cooke, J. Lange non al. and *C. cumatilis* s. Kühner & Romagnesi non al., which was renamed *C. balteatocumatilis* by R. Henry (*Bull. Soc. mycol. Fr.* **55** (1939), 186) without a Latin diagnosis.

CORTINARIUS (PHLEGMACIUM) *CALOCHROUS* (Pers. ex Fr.) Fr.

In *Cortinarius* I (p. 38) I gave a description under this name which I now know to be a mixture. The large sized specimens mentioned were, I think, of the fungus described below as *C. xanthochrous*, which differs from *C. calochrous* in cap colours, yellow veil and more robust habit. *C. calochrous*, which I would take in the sense of J. Lange and Konrad & Maublanc, is a more slender fungus with persistently bright yellowish cap, bright violet gills and no yellow veil in addition to the cortina. The description here should therefore replace that in *Cortinarius* I.

Cap 40–70 mm., convex then expanded or slightly depressed, *pale to bright chrome-yellow* or more rarely lemon-yellow, sometimes tinged ochre or rusty in centre but *retaining yellow colour for a long time*, smooth. *Gills* *bright and rather persistently lilac or blue-violet* then clay-violaceous, finally rusty or rusty-umber, crowded, usually narrow. *Stem* 40–75/6–13 mm. (16–28 in bulb), equal or slightly thickened at apex with conspicuous marginate bulb, *white then whitish*, sometimes yellowish at base, cortina whitish, bulb whitish, soon yellowish on the edge, white tomentose below. *Flesh* white or whitish, often yellowish under cap cuticle, over gills or in bulb when old. *Smell* none. *Taste* mild. *Spores* amygdaliform, punctate, 10–12/5–6 μ. (*Gill edge* not investigated.) NaOH + flesh yellowish, + cap cuticle reddish brown to bright red.

Under beech, especially on basic soils. Not uncommon, at least in south-east England. Differs from *C. xanthochrous* in lack of yellow veil, more persistently yellow cap and gills at first deeper and brighter lilac or blue-violet and retaining this colour for a long time. Differs from *C. parvus* and others in the white or whitish stem, quite without any blue-violaceous tinge, inside or outside.

Cortinarius (*Phlegmacium*) **caroviolaceus** sp.nov.

Pileus 45–120 mm., e convexo expansus, ex albo albidus vel pallide ochraceus dein pallide ochraceo-luteolobrunneus hac atque illac obscuriore coloratus, postremo totus ochraceo-luteolobrunneus, primo viscidissimus, vulgo e velo albo squamis adpressis sericeis maculatus et ad marginem residuis cortinae obtectus, senectute interdum leviter innatofibrillosus, ad marginem primo involutus et pallidiore coloratus. Lamellae adnatae emarginatae, fere lineares, ex albo argillaceae dein pallide ochraceo-argillaceae, postremo ochraceo- vel ferrugineo-luteolobrunneae, confertae, ad aciem interdum pallidiore coloratae, aequales vel inaequales. Stipes 50–80/11–15 mm. (ad bulbum 32–40 latus), aequalis bulbo conspicuo late marginato, ex albo praecipue infra luteolus vel ochraceus, juventute rariore ad apicem caeruleotinctus, albo-sericeostriatus, infra bulbum albo-tomentosus; cortina alba. Caro ex alba praecipue sub cuticula pilei et ad basim bulbi sordide brunneola vel luteolotincta, juventute ad apicem stipitis fugace caeruleo-violaceotincta. Odor fortis, peculiaris, graveolens. Sapor mitis. Sporae amygdaliformes vel limoniformes, asperae, 10–12(13)/6–6½ μ. Acies lamellarum fertilis. Caro + NaOH leviter lutescens; cuticula pilei + NaOH leviter brunnescens.

In fagetis solo calcareo, Norbury Park, Mickleham, Surrey, 15 Oct. 1952; 14 Oct. 1953 (typus in Herb. Kew.). A coloribus primo totus albis dein ochraceascentibus, carne apicis stipitis caeruleo-violaceotincta, odore, statura robusta et bulbo magno insignis.

For description in English see *Cortinarius* 1 (p. 34); distinguished by being entirely white at first later discolouring ochraceous, size often large, bulb conspicuous, smell and fugacious blue tinge in flesh of stem apex. Apart from this blue tinge, resembling *C. rapaceus* as described by older authors; *C. rapaceus* s. Ricken, J. Lange with spores 9–12/5–7 μ may be the same, but *C. rapaceus* s. Bresadola has spores 7–9/4–5 μ which suggests a different fungus. *C. caroviolaceus* is *C. aleuriosmus* s. Kauffmann and J. Lange non R. Maire, but when I renamed it (l.c.) I gave no Latin diagnosis.

Cortinarius (*Phlegmacium*) **citrinus** sp.nov.

Pileus 40–60 mm., e convexo expansus, obscure citrinus dein olivaceo- vel viride-tinctus, vulgo unicoloratus, rariore senectute ad discum leviter ferrugineo- vel fulvo-tinctus, jove pluvio viscidus, rariore lineato-maculatus, ad marginem primo involutus. Lamellae adnatae, fere lineares, obscure citrinae vel sulphureo-viridulae dein olivaceo-luteolobrunneae vel ferrugineo-olivaceae, ad aciem aequalis vel leviter inaequalis. Stipes 45–80/7–12 mm. (bulbo 12–30 lato), aequalis bulbo conspicue late marginato,

obscure citrinus vel sulphureo-viridulus interdum senectute praecipue ad apicem pallidiore coloratus, bulbo interdum infra applantato e mycelio citrino tomentoso; cortina citrina. Caro totus citrina vel sulphureo-viridula. Odor fere nullus. Sapor mitis. Sporae limoniformes, asperae, 9–11/5–6 μ. Acies lamellarum fertilis. Caro et cuticula pilei +NaOH obscure olivascentes vel olivaceo-brunnescentes.

In fagetis solo calcareo, Gomshall, Surrey, 1 Oct. 1950; Polesden Lacey, Surrey, 14 Oct. 1958 (typus in Herb. Kew.). A coloribus totus citrinus vel sulphureo-viridulis et effectu NaOH insignis. C. splendens a coloribus magis sulphureo-flavis, effectu NaOH dissimile rufescente, C. pseudo sulphureus a pileo partim olivaceobrunneo et coloribus lamellarum stipiteque pallidioribus differunt.

For description in English see *Cortinarius* I (p. 50); distinguished by being ± entirely dark lemon-yellow or sulphur-greenish. *C. splendens* differs in being more sulphur-yellow or golden and in having a different NaOH reaction on the cap cuticle (red or reddish brown). *C. pseudosulphureus* differs in the cap partly olive-brown from the start and paler gills and stem. This is *C. elegantior* f. *citrinus* J. Lange (*Dansk. bot. Ark.* **8**, no. 7 (1935), 17) = *C. sulphureus* var. *citrinus* J. Lange (*Flora Agaricina Danica*, III (1938), 18) = *C. citrinus* (J. Lange) R. Henry (*Bull. Soc. mycol. Fr.* **55** (1939), 176) all without Latin diagnoses.

Cortinarius (*Phlegmacium*) **durus** sp.nov. (Fig. 378)

Pileus 56–130 mm., e convexo expansus, umbrinus vel sordide ochraceo-luteolobrunneus vulgo ad discum obscuriore coloratus, et ad marginem pallide luteolobrunneus, juventute viscidus sed mox siccus innato-sericeus vel sericeo-tomentosus, interdum obscuriore lineato-maculatus, e velo albo vel albido squamis adpressis sericeo-floccosis variegatus, ad marginem diu involutus et minute velutino-tomentosus. Lamellae adnatae, ex albido vel argillaceo-albido argillaceo-luteolobrunneae postremo ochraceo-luteolobrunneae, confertae, L ca. 100–150 l 1–3, ad aciem integrae vel leviter inaequales. Stipes 60–110/16–28 mm. (infra 20–45), clavato-bulbosus, interdum deorsum attenuato-radicatus, ex albido pallide luteolobrunneus vel sordide flavidus dein ochraceo-flavidus vel sordide luteolobrunneus, sericeo-striatus, infra zonam cortinae e velo albo vel pallido indistincte maculatus, durus, ad bulbum albotomentosus; cortina alba interdum evanescens. Caro alba vel albida, sub cuticulis sordide flavida, juxta lamellas cornea. Odor nullus vel pileo fracto gratus. Sporae amygdaliformes vel limoniformes, punctatae (10)11–13/5½–6½ μ (Fig. 378). Acies lamellarum fertilis. Caro+NaOH immutabilis vel levissime flavida.

In pinetis, Rothiemurchus Reserve, 26 Sept. 1958 (typus in Herb. Kew.), et Loch-an-Eilean, Rothiemurchus, Inverness-shire, 12 Sept. 1957 (legit D. A. Reid). Carne dura, coloribus sordidis, velo albo vel pallido insignis. C. (P.) claricolor sensu Konrad & Maublanc non Fries idem censeo.

Cap 56–130 mm., convex then expanded, *date-brown or dirty ochraceous-buff*, often darker at centre and with paler buff margin, viscid when fresh, *soon dry and matt or innately-silky or silky-tomentose*, sometimes date-brown streaky or radially blotched in outer part, white or whitish veil leaving zones of fairly broad adpressed silky-floccose scales chiefly in outer part, margin incurved and minutely velvety-tomentose for a long time and sometimes with cortinal remnants at first. *Gills* adnate often with slight tooth, *whitish or clay-whitish then clay-buff* or pale ochraceous buff finally ochraceous-buff, crowded, L *ca.* 100–150 l 1–3, edge even or slightly uneven. *Stem* 60–110/16–28 mm. (20–45 below), clavate-bulbous sometimes with slightly pointed rooting base, whitish soon pale buff or dirty yellowish then ochraceous-yellowish or pallid-buff, silky fibrillose-striate, white cortina leaving sometimes rather fugacious zone, white or pale buff

veil forming sometimes indistinct patches below this, *hard and firm*, cuticle rather rigid and almost peeling, slightly white-pithy especially below, bulb white tomentose. *Flesh* white or whitish, tinged dirty yellowish especially under the cuticle, horny over gills and sometimes also cuticle of stem apex. *Smell* none or fairly strong and pleasant fungussy especially when cut, rather rank when old. *Spores* amygdaliform or limoniform, punctate (10)11-13/5½–6½ μ (Fig. 378). *Gill edge* fertile. NaOH + flesh nil or very slightly yellowish, + cap cuticle darker date- or reddish brown.

Under pines. Nature Reserve, Rothiemurchus, 26 Sept. 1958 (type in Herb. Kew). Recognized by hard flesh, dull colours and white or whitish veil. This is *C.* (P.) *claricolor* s. Konrad & Maublanc but plainly not s. Fries, who describes the cap colour as 'luteus, immutabilis'. *C.* (P.) *rufoalbus* (= *C.* (P.) *claricolor* s. J. Lange) is more red-brown, has larger spores and an unpleasant smell and grows in beech woods. *C.* (P.) *turmalis* has smaller spores and more copious white veil.

Cortinarius (*Phlegmacium*) **melliolens** sp.nov.

Pileus 40–100 mm., e convexo expansus, pallide vel clare flavo-ochraceus vel fulvo-luteolobrunneus, e velo juventute totus albo-sericeo canus (R. caperato similis), jove pluvio viscidus, ad marginem primo involutus dein tenuis residuis cortinae interdum decoratus. Lamellae ex albido argillaceae dein argillaceo-luteolobrunneae vel -ochraceae, confertae, ad aciem inaequales vel serrulatae. Stipes 50–105/7–18 mm. (ad bulbum 18 36), aut clavatus bulbo immarginato aut aequalis bulbo conspicue marginato, albus dein lutescens vel ochraceascens, ad basim albo-tomentosus; cortina alba. Caro albida vel praecipue sub cuticula pilei vel in stipite leviter luteola. Odor debilis vel fortis, melliolens. Sapor mitis. Sporae ellipsoideae vel ellipsoideo-amygdaliformes, fere laeves, 8–9/4½–5 μ. Acies lamellarum fertilis. Caro et cuticula pilei + NaOH brunnescens.

In silvis deciduis et coniferis. Plodda Falls, Guisachan, Inverness-shire, 18 Sept. 1956 (in betuletis); Lower Tullochgrue, Rothiemurchus, Inverness-shire, 9 Sept. 1957 (in betuletis et sub Juniperis; typus in Herb. Kew.). A sporis fere ellipsodeis < 10 μ longis, odore melliolente insignis. C. (P.) multiformis sensu Konrad & Maublanc, auct. a sporis majoribus (9–11/5½–6½ μ) amygdaliformibus vel limoniformibus odore aciduloso vel pomorum, C. (P.) ochropallidus a sporis majoribus (9–11/5–6 μ) ellipsoideo-amygdaliformibus odore nullo coloribus pallidioribus differunt. C. (P.) allutus sporas similes habet sed a coloribus ferrugineis vel fulvo-brunneis et statura minore differt.

For description in English see *Cortinarius* 1 (p. 28); recognized by relatively small ± ellipsoid spores < 10 μ long, rather bright coloured cap with hoary veil at first and smell of honey. *C.* (P.) *multiformis* s. Konrad & Maublanc, auct. differs in larger amygdaliform or limoniform spores (9–11/5½–6½ μ), smell of apples and redder NaOH reaction on cap cuticle; *C.* (P.) *ochropallidus* is paler and more uniformly coloured and inodorous and has spores ellipsoid-amygdaliform 9–11/5–6 μ. *C.* (P.) *allutus* is bright rusty or tawny-brown and usually small in stature but has similar spores. This is *C.* (P.) *multiformis* s. Ricken and Bresadola, which was renamed *C. melliolens* by J. Schaeffer (*Z. Pilzk.* (1949), no. 2, 20) but without Latin diagnosis.

Cortinarius (*Phlegmacium*) **osmophorus** sp.nov.

Pileus 40–70 mm., e convexo expansus interdum depressus, ochraceus vel flavido-ochraceus interdum fulvotinctus, juventute ad marginem luteus, senectute vulgo rufobrunneo maculatus, jove pluvio viscidus, ad marginem primo involutus dein expansus.

Lamellae adnatae, haud raro profunde emarginatae, ex albo vel albido interdum luteotincto argillaceo-ochraceae postremo ferrugineo-ochraceae, subconfertae, ad aciem pallidiore coloratae ± inaequales. Stipes 30–40/7–12 mm. (ad bulbum 20–30), aequalis bulbo lato vulgo obliquo marginato, ex albo lutescens vel ochraceascens postremo ferrugineo-ochraceus, infra zonam cortinae albosericeo striatus, infra bulbum albotomentosus; cortina alba. Caro alba, interdum partim flavidotincta. Odor fortissimus, penetranter, suavis (odore Philadelphi similis). Sporae 9–10/5–6 μ amygdaliformes vel sublimoniformes, punctatae. Cellulae steriles aciei lamellarum clavatae 6–8 μ latae. Caro + NaOH immutabilis vel flavidotincta; cuticula pilei + NaOH rufobrunnea.

In fagetis solo calcareo: Hackhurst Downs, Gomshall, Surrey, 30 Sept. 1951 et 2 Oct. 1953 (typus in Herb. Kew.); Norbury Park, Mickleham, Surrey, 5 Oct. 1951 et 23 Sept. 1953; Polesden Lacey, Surrey, 12 Oct. 1951 et 16 Oct. 1953. Odore penetranter suave et coloribus maxime insignis. Est quasi C. multiformis odoratus.

For description in English see *Cortinarius* I (p. 32 as *C. evosmus*). Easily distinguished by the penetrating sweet smell and colours approximately those of *C. multiformis*. I have sometimes smelt this fungus in the field before I have seen it. This is *C.* (P.) *evosmus* Joachim apud R. Henry (*Rev. Mycol., Paris*, **8** (1943), Suppl., 39; *Bull. Soc. mycol. Fr.* **67** (1951), 315, without Latin diagnosis). Not having seen Joachim's notes I have described this as a new species under a different name, but there seems little doubt that my fungus is the same as that cited invalidly by R. Henry.

Cortinarius (*Phlegmacium*) **pseudosulphureus** sp.nov.

Pileus 50–100 mm., e convexo expansus, pallide sulphureus vel olivaceo-citrinus, exceptione marginis glutine olivaceobrunneo oblitus, siccitate vulgo squamoso-maculatus vel notatus, ad marginem primo involutus diu sulphureo- vel citrino-tinctus. Lamellae adnatae, e pallide citrino olivaceo-citrinae vel ochraceo-luteolobrunneae postremo olivaceo-ferrugineae, ad aciem aequales dein ± inaequales. Stipes 30–80/8–20 mm. (ad bulbum 20–35), aequalis vel sursum leviter attenuatus bulbo conspicue late marginato, pallide citrinus, infra bulbum vulgo applanatum citrino-tomentosus, mycelio citrino vel pallide sulphureo radicibus, filiformibus terminatus; cortina olivaceo-tincta. Caro pallide vel obscuriore citrina, aut unicolorata aut sub cuticulis obscuriore colorata. Odor nullus. Sapor mitis. Sporae amygdaliformes vel sublimoniformes, asperae, 9½–11/5–6 μ. Caro et cuticula pilei + NaOH olivaceo-viridescens vel -brunnescens.

In fagetis solo calcareo, Hackhurst Downs, Gomshall, Surrey, 10 Oct. 1952. C. sulphureus sensu J. Lange idem est (non C. fulmineus var. sulphureus Kauffm.). Absentia exsiccatorum descriptionem et iconem C. sulphurei in Flora Agaricina Danica, III (1938), 18, Pl. 85 B typum designo. A C. citrino maxime accedit, sed a pileo glutine olivaceo-brunneo oblito coloribus pallidioribus lamellarum stipitisque differt. C. splendens ab effectu NaOH cuticula pilei ± rufescente, coloribus magis sulphureis differt.

For description in English see *Cortinarius* I (p. 52). Recognized by olive-brown gluten on cap and pale lemon-yellow of other parts of the fruit body and NaOH reaction on cap cuticle; *C. citrinus* has similar reaction but is ± unicolorous deep lemon-yellow or sulphur-greenish and has deeper coloured gills and stem when young. *C. splendens* has a different reaction on the cap cuticle (red-brown not olive) and is brighter sulphur or golden-yellow. This is *C. elegantior* [Fr.] Fr. s. J. Lange non al. (*Dansk. bot. Ark.* **8**, no. 7 (1935), 17), later described by J. Lange as *C. sulphureus* (Kauffm.) J. Lange (*Flora Agaricina Danica*, III (1938), 18), but not *C. fulmineus* var. *sulphureus* Kauffmann (*Agarics of Michigan* (1915), p. 354) which differs in smaller spores (8–10/4–5½ μ) and the more uniform sulphur-yellow without olive tints. R. Henry (*Bull. Soc. mycol. Fr.* **73**

(1957), 36) correctly recorded this error of name and renamed J. Lange's fungus *C. pseudosulphureus* but without Latin diagnosis. In the absence of exsiccata I designate the above-mentioned description of J. Lange and the accompanying plate (L 85 B) the type.

Cortinarius (*Phlegmacium*) **subfulgens** sp.nov.

Pileus 60–100 mm., e convexo expansus, fulvo-aurantius vel fulvo-ochraceus ad marginem flavus, aureus vel aurantio-flavus, jove pluvio viscido, glaber, ad marginem primo involutus. Lamellae adnatae, mox intense flavae postremo ferrugineo-flavae vel -ochraceae, subconfertae, ad aciem integrae. Stipes 40–70/15–25 mm. (ad bulbum 30–50), aequalis bulbo lato conspicue marginato, flavo-ochraceus, deorsum fulvo- vel ferrugineo-tinctus, bulbo interdum applanato luteo dein ferrugineo-tincto; cortina flavida. Caro flavida vel pallide ochracea deorsum fulvo-ochraceo vel -luteolobrunneo obscurascens. Odor nullus. Sporae sublimoniformes, asperae, 9–11/5–6 μ.

In silvis deciduis. A coloribus et pileo glabro insignis. C. fulgens sensu Cooke, J. Lange non Fries idem est. C. fulgens sensu Fries a pileo conspicue obscuriore innato-fibrilloso, lamellis juventute pallidioribus, carne pallidiore colorata differt. Absentia exsiccatorum iconem Cookeianum C. fulgentis in 'Illustrations of British Fungi' 716 (716) typum designo.

For description in English see *Cortinarius* I (p. 48). Recognized by smooth bright-coloured cap, deep yellow gills when young and darker flesh at base of stem and in bulb. This is *C.* (P.) *fulgens* (Alb. & Schw. ex Secr.) Fr. s. Cooke, J. Lange non Fries; s. Fries, Kauffmann differs in the conspicuously innato-fibrillose cap (fibrils dark, almost chestnut), paler yellow young gills and paler flesh. It seems likely to have broader spores also but I have no personal evidence of this. *C. fulmineus* differs in the distinctly scaly cap and different colours. In the absence of exsiccata I designate the Cooke plate (*Illustrations of British Fungi*, p. 716 (716)) as the type. This was collected by Cooke in Fownhope Wood, Herefordshire; there is a specimen in Herb. Kew without data which may belong to this collection and which has sublimoniform spores 9–11/5–6 μ, but in view of its uncertain origin this specimen cannot unfortunately be designated the type.

Cortinarius (*Phlegmacium*) **subtriumphans** sp.nov.

Pileus 50–120 mm., e convexo expansus interdum late umbonatus, ochraceus, aurantiaco-ochraceus vel fulvo-brunneus, ad marginem vulgo pallidiore luteolus vel ochraceus, jove pluvio viscidus, fibrillis innatis rufis vel umbrinis praecipue juxta marginem notatus, interdum ad marginem e velo squamulis adpressis ochraceis vel rufobrunneis obtectus, ad marginem vulgo residuis cortinae appendiculatae decoratus. Lamellae adnatae interdum emarginatae, e pallide argillaceo argillaceo-ochraceae dein ferrugineo-argillaceae vel -ochraceae, confertae, L 90–150 l 1–3, ad aciem aequales vel leviter denticulatae. Stipes 65–100/10–20 mm. (ad bulbum 18–32), clavato-bulbosus vel ad basim incrassatus, luteolobrunneus vel ochraceus, interdum infra obscuriore coloratus, ad apicem luteolo-albidus, e velo crasso lanato luteolobrunneo, ochraceo vel olivaceo primo maculatus dein glabrescens. Caro albida, interdum hac atque illac luteolo-ochraceus, firma. Odor nullus vel debilis. Sapor mitis. Sporae amygdaliformes, asperae, 9–11/5–6 μ. Acies lamellarum fertilis. Caro + NaOH luteolo- vel leviter aurantiaco-brunnea; cuticula pilei + NaOH obscure brunneola.

In silvis, Badger Falls, Glen Affric, Inverness-shire (in betuletis) 17 Sept. 1956, 21 Sept. 1956 (typus in Herb. Kew.). Coloribus veli pileique, pileo innato-fibrilloso et sporis sociis insignis. C. triumphans a sporis majoribus coloribus magis flavis, carne + NaOH clare flavescente et pileon on innato-fibrilloso, C. crocolitus a lamellis primo interdum caeruleotinctis, pileo pallidiore flavotincto differunt.

For description in English see *Cortinarius* I (p. 56). Distinguished by innately fibrillose cap and woolly ochraceous or olivaceous veil. *C. triumphans* has larger spores and the NaOH reaction on the flesh is bright yellow. *C. crocolitus* is paler and yellower with smooth cap and gills sometimes tinged bluish at first. I have found all three recently under birch. This is *Phlegmacium triumphans* (Fr.) Ricken s. Ricken (not *C.* (*P.*) *triumphans* Fr. s. Fries, Kauffmann, R. Henry, auct.) which was renamed *C. subtriumphans* by R. Henry (*Rev. Mycol., Paris,* **10** (1945), fasc. 2, Suppl., 23) but without Latin diagnosis.

Cortinarius (*Phlegmacium*) **subturbinatus** sp.nov.

Pileus 35–100 mm., e convexo expansus, fulvo-luteolobrunneus vel ferrugineo-ochraceus vulgo senectute obscuriore coloratus (fere umbrinus), ad marginem primo luteolus, e velo albido maculis adpressis praecipue juxta marginem sparse obtectus, jove pluvio viscidus, margine diu involuto, senectute leviter vel aliquantum conspicue innato-fibrillosus. Lamellae adnatae haud ventricosae, e pallide argillaceo ochraceo-argillaceae dein ferrugineo-luteolobrunneae, confertae, ad aciem primo integrae dein vulgo serrulatae. Stipes 35–100/7–20 mm. (ad bulbum 18–45) aequalis bulbo latissime interdum oblique marginato, albus, infra lutescens vel ochraceascens, bulbo albo dein luteolo vel ferrugineo-tincto infra albo-tomentoso; cortina alba. Caro alba, ad basim stipitis et sub cuticula pilei lutescens vel ochraceascens, primo fere dura. Odor debilis vel fere fortis, graveolens (rariore juventute fere suaveolens). Sapor mitis. Sporae amygdaliformes vel sublimoniformes, asperae, (10)11–14/6–7½(8) μ. Acies lamellarum fertilis. Caro + NaOH fere immutabilis, cuticula pilei + NaOH lente fuscescens vel purpureo-brunnescens.

In fagetis solo calcareo: Polesden Lacey, Surrey, 16 Oct. 1953 (typus in Herb. Kew.); Gomshall, Surrey, 18 Oct. 1953. A pileo velo maculato, odore, sporis insignis. C. napus a colore pilei castaneo, odore nullo, sporis majoribus, habitatione in silvis coniferis differt. C. multiformis a sporis minoribus, coloribus et stipite interdum bulbo haud marginato differt.

For description in English see *Cortinarius* I (p. 30). Distinguished by patches of veil on cap, smell, spore size and shape, white flesh when young and habitat. *C. napus* and *C. corrosus* are coniferous wood species, the former with chestnut cap and larger spores, the latter with cap soon dry and flocculose and subfusiform narrower spores. *C. multiformis* has smaller spores, is yellower and the stem-bulb is sometimes barely marginate. This is *C. subturbinatus* R. Henry and is most likely *C. sulphurinus* Quél. s. J. Lange non Quél. (nec *Phlegmacium sulphurinum* (Quél.) Ricken s. Rick.), which was renamed and redescribed as *C. subturbinatus* by R. Henry (*Bull. Soc. mycol. Fr.* **55** (1939), 167) but without Latin diagnosis; my fungus agrees with the description of *C. subturbinatus* given by R. Henry and was indeed recorded as such by Pearson (these *Trans.* **35** (1952), 113); other material sent by me to Pearson was recorded (l.c. 114) as *C. sulphurinus* var. *langei*, but I have deleted this name from the British list since I think the fungus originally described by R. Henry as *C. sulphurinus* var. *langei* is different, the collection recorded by Pearson under this name being *C. subturbinatus*.

Cortinarius (*Phlegmacium*) **violaceocinctus** sp.nov. (Fig. 253)

Pileus 60–100 mm., e convexo expansus, fulvo-mellinus vel ferrugineo-ochraceus, vulgo ad marginem pallidiore flavido- vel ochraceo-tinctus, jove pluvio viscidus, interdum ad marginem obscuriore lineato-maculatus, ad marginem primo e cortina alba appendiculata etiam vulgo residuis veli cremei vel pallido-lutei decoratus. Lamellae adnatae, vulgo angustae, ex albido pallidissimo ochraceae interdum leviter argillaceo-tinctae postremo pallide argillaceo-ochraceae, confertae, L ca. 130–150 l 1–3, ad aciem leviter pallidiore coloratae et minute inaequales. Stipes 70–112/20–23 mm. (infra 28–34), clavato-bulbosus vel infra incrassatus, ex albido vel pallide cremeo praecipue ad mediam partem pallido-luteus, interdum partim ferrugineo-ochraceascens, subtiliter albo-sericeo striatus, infra e velo albido, cremeo vel pallide luteo transversim cinctus, interdum parte supera cinctu juventute violaceo-tincta senectute pallide argillaceo-violacea vel albido-cremea, durus, ad basim albo-tomentosus; cortina alba. Caro stipitis alba vel albida, pilei sordide lutea vel colore pilei tincta, juxta lamellas cornea, interdum partim pallido-lutescens. Odor fracta aliquantum fortis, peculiaris, fere odori Solani tuberosi incocti similis. Sporae fusiforme-amygdaliformes (9)10–12/(4¾)5–5½ μ (Fig. 253), haud punctatae. Cellulae steriles aciei lamellarum ± clavatae 6–8 μ latae. Caro stipitis + NaOH aliquantum flavescens.

C. balteatocumatili affinis sed a pileo sine coloribus violaceis, velo minus clare violaceotincto, sporis leviter minoribus differt.

In betuletis, Rothiemurchus, Inverness-shire, 5 Sept. 1958 (typus in Herb. Kew.).

Cap 60–100 mm., convex then expanded, *tawny-honey or rusty-buff*, generally with paler more yellowish or ochraceous margin, sometimes also with darker streaks towards margin, viscid when moist, margin at first with copious appendiculate cortina and often also remnants of creamy or pale yellowish veil. *Gills* adnate, emarginate often with slight tooth, often rather narrow-linear, *whitish then very pale ochraceous or ochraceous-buff sometimes with slight clay tinge*, finally pale clay-ochraceous buff, crowded, L *ca.* 130–150 l 1–3, edge slightly paler minutely uneven. *Stem* 70–112/20–23 mm. (28–34 below), clavate-bulbous or thickened below, whitish or pale cream then pale yellowish especially in middle, sometimes discolouring rusty-ochre in places, finely white silky striate, *veil forming whitish, pale cream or pale yellowish ring-zone or bands in lower part, upper zone often tinged violaceous when fresh*, this violaceous tinge either disappearing or persisting as a pale dull clay-violaceous zone, *hard and firm*, base white tomentose. *Flesh* in stem white or whitish, in cap pale dirty yellowish or tinged cap colour, horny over gills, discolouring pale yellowish in places especially in stem cortex. *Smell* rather strong when cut, peculiar, rather like raw potato. *Spores fusiform-amygdaliform*, punctate, *(9)10–12/(4¾)5–5½* μ (Fig. 253). *Gill edge* sterile, cells ± clavate 6–8 μ diam. *Basidia* 4-spored. Flesh + NaOH (especially in stem) rather deep chrome-yellow to faintly yellow, sometimes tinged ochraceous in cap; cap cuticle + NaOH darker brown.

Under birches, Rothiemurchus, 5 Sept. 1958 (type in Herb. Kew). *C. balteatocumatilis* is rather similar but has a blue-violaceous marginal zone to cap, veil more distinctly violaceous and broader spores (10)10½–12½(13)/5½–6½ (Fig. 252).

Cortinarius (*Phlegmacium*) **xanthocephalus** sp.nov.

Pileus 20–60 mm., e convexo expansus interdum umbonatus, pallide ochraceo-luteus vel citrinus interdum olivaceobrunneo lineato maculatus, jove pluvio viscidus, jove sicco nitidus, ad marginem diu involutus. Lamellae adnatae, pallide purpureo-lilacinae dein argillaceo-brunneae vel fere umbrinae, subconfertae, L ca. 40 l 1–3, ad aciem aequales vel inaequales. Stipes 25–70/4–7 mm. (infra 4–12), clavatus vel leviter ventricosus, raro aequalis, ex albido sursum ochraceascens, ad apicem ± lilacinus; cortina sparsa, fugacis.

Caro albida vel pallido-ochracea ad apicem stipitis leviter lilaceo-tincta. Odor nullus. Sporae subglobosae vel late ovoideae, asperae, 8–10/6–7 μ.

In silvis (praecipue deciduis), Loch Craiglush, Dunkeld, Perthshire, 14 Sept. 1957 (typus in Herb. Kew.). A sporis subglobosis, coloribus et habitatione facile distinguitur. C. decolorans s. Cooke, P. D. Orton, 1955 idem est. C. decolorans s. Fries, Ricken (sub nom.gen. Phlegmacium), Bresadola a sporis majoribus, amygdaliformibus et habitatione in silvis coniferis differt.

For description in English see *Cortinarius* 1 (p. 66) as *C. decolorans*. Readily recognized by subglobose spores. This is *C.* (P.) *decolorans* (Pers. ex Secr.) Fr. s. Quélet, Cooke, Moser, 1952, P. D. Orton, 1955 but not s. Fries, Ricken (as *Phlegmacium decolorans*), Bresadola, which differs in the larger amygdaliform spores and habitat in coniferous woods. The latter is included in the 'List' as *C. decolorans*, though regarded as a var. of *C.* (P.) *varius* by some authors, differing from it chiefly in cap colour, but since I have no personal notes on *decolorans* I prefer to leave it as a separate species for the moment.

Cortinarius (*Phlegmacium*) **xanthochrous** sp.nov.

Pileus 40–100(150) mm., e convexo expansus interdum depressus, primo ochraceo-flavus vel ferrugineo-ochraceus ad marginem aureoflavus, interdum praecipue ad discum ferrugineo maculatus, dein ferrugineo-fulvus vel -ochraceus et ad marginem pallidiore coloratus, jove pluvio viscidus, jove sicco interdum rugulosus, primo e velo albido vel luteo squamis sericeis adpressis maculatus. Lamellae adnatae, e pallide carneo- vel purpureo-lilacino argillaceo-lilacinae vel -ferrugineae postremo obscure ferrugineae, confertae, L ca. 80–120 l 3, ad aciem ± integrae. Stipes 27–65/9–17 mm. (ad bulbum 22–27), ± aequalis bulbo marginato interdum obliquo vel infra applanato, supra albidus infra pallide luteus dein sursum ochraceascens, residuis veli aureoflavis dein ferrugineo-tinctis ad bulbum et ad partem infernam manifeste obtectus, infra bulbum albo-tomentosus; cortina pallide lutea. Caro pallide ochraceo-lutea, juxta lamellas cornea, interdum in bulbo fortiore luteotincta. Odor nullus vel debilis, nauseoso-suavis. Sporae sublimoniformes, asperae, 10–12/6–6½ μ. Acies lamellarum fertilis. Caro + NaOH sordide ferrugineo-ochrascens; cuticula pilei + NaOH cito vinoso-ruber vel rubro-brunnea.

In fagetis solo calcareo, Mickleham, Surrey, 12 Oct. 1958 (typus in Herb. Kew.). A coloribus, velo aureoluteo, cuticula pilei + NaOH rubrotincta, sporis et habitatione insignis. C. arquatus sensu Moser a stipite vulgo lilaceo vel violaceo tincto, sporis angustioribus, C. calochrous s. Fries (1821, 1838), J. Lange absentia veli, coloribus pilei lamellarumque differunt. C. calochrous s. Fries, 1854, 1874, probabiliter idem est.

Cap 40–100(150) mm., convex then expanded sometimes depressed, at first *ochre-yellow or rusty-ochre with golden-yellow margin*, sometimes with darker rusty spots at centre, *gradually deepening* to ± entirely rusty-ochre or -tawny with slightly paler margin, viscid when moist, sometimes wrinkled, rugulose or cracked when dry, veil forming often fugacious whitish or yellowish adpressed silky scales. *Gills* adnate, *pale reddish or purplish lilac* (often deeper coloured towards cap edge) *then clay-lilac to rusty-clay* finally deep rusty, crowded, L *ca.* 80–120 l 3, edge concolorous ± even. *Stem* 27–65/9–17 mm. (22–27 in bulb), ± equal with sometimes oblique or flattened marginate bulb, whitish above, pale yellowish below then tinged ochraceous-yellowish or golden-ochraceous from base, *bulb and lower part with conspicuous golden-yellow veil remnants* which later become ochraceous or rusty, bulb white tomentose on the underside. *Flesh* pale ochraceous-yellowish, sometimes slightly brighter yellowish in bulb, horny over gills. *Smell* none or faintly sickly-sweet. *Spores* sublimoniform, rough, 10–12/6–6½ μ. *Gill edge* fertile. Flesh + NaOH dirty rusty-ochraceous; cap cuticle + NaOH *quickly wine-red* or rusty-red.

In beech woods on chalk soil, Mickleham, 12 Oct. 1958 (type in Herb. Kew) and elsewhere. Recognized by colours (lilac or purplish tinge in young gills only), golden-yellow veil, NaOH reaction on cap cuticle, spores and habitat. *C. arquatus* s. Moser differs in having the stem also often lilaceous and in the narrower spores; *C. calochrous* s. Fries (1821, 1838), J. Lange has no yellow veil, but a more persistently bright yellow cap and bright blue-violaceous young gills. This is the fungus I wrongly described as *C. pansa* in *Cortinarius* 1 (p. 40). I also included in my description of *C. calochrous* notes from at least one collection which I now think was probably this fungus. The original diagnosis of *C. calochrous* by Fries (1821) makes no mention of yellow veil and describes the gills as 'violaceo-purpureis' and 'colore lamellarum eleganti sat persistenti, demum vero cinamomeo mox dignoscitur'. In *Epicrisis* (1838), p. 265, the diagnosis is similar but Fries adds 'Pileus vulgo fulvus circa marginem luteus, saepe guttatus glebisque inquinatus'. It is not until the description in *Monographia* (1854) that Fries mentions a yellow veil, which is also given in *Hymenomycetes Europaei* (1874). *C. calochrous* s. Fries, 1821, 1838, is, I think, well described and portrayed by J. Lange; I suspect that my *C. xanthochrous* is very probably the later *C. calochrous* of Fries. *C. calochrous* s. Cooke is almost certainly *C. xanthochrous* also, since the yellow veil is clearly visible in the plate Cke 707 (713) and especially on the originals, also stature and cap colours are in agreement. R. Henry has described a *C. cookeianus* to which he refers this Cooke plate, but I cannot agree with this since *C. cookeianus* is described as having bluish flesh in the stem (absent in Cooke's plate) and there is no mention of a yellow veil. I am afraid that past records in this country of '*C. calochrous*' are likely to be a mixed bag!

Cortinarius (*Phlegmacium*) **xantho-ochraceus** sp.nov.

Pileus 50–105 mm., e convexo expansus vulgo umbonatus interdum postremo depressus, pallide luteus vel flavidus, senectute obscuriore flavus vulgo ad discum ochraceo-tinctus, jove pluvio viscidus, jove sicco vel senectute interdum leviter innatofibrillosus, e velo albo squamis adpressis variegatus, ad marginem primo involutus mox expansus. Lamellae adnatae, ex albo pallide argillaceae (diu pallidae) dein argillaceo-ferrugineae vel ochraceae, confertae, ad aciem pallidiore coloratae ± inaequales. Stipes 40–80/10–22 mm. (in bulbum 20–35), aequalis bulbo lato vulgo obliquo marginato, albus mox praecipue ad basim ochraceo-lutescens, bulbo albo dein ± ochraceo; cortina alba aliquantum sparsa. Caro ex albido ochraceo-lutescens, primo durissimo. Odor nullus vel debilis. Sporae ellipsoideo-amygdaliformes, punctatae, 8-10(11)/5-6 μ. Acies lamellarum fertilis. Caro + NaOH leviter obscuriore colorata; cuticula pilei + NaOH leviter rubrobrunnescens. Caro + sulfoformol immutabilis.

In fagetis solo calcareo. Polesden Lacey, 16 Oct. 1953 (typus in Herb. Kew.); Abbot's Wood, Goring Heath, Oxon, 3 Nov. 1955. Colore pilei luteo, carne juventute durissima senectute lutescente, lamellis diu pallidis, sporis mediocre amplitudine insignis. C. (P.) langei sensu P. D. Orton, 1955 idem est, C. langei sensu R. Henry probabiliter altera species est.

This is the fungus described by me as *C. langei* in *Cortinarius* 1 (p. 30). R. Henry described a *C. sulphurinus* var. *langei* for *C. sulphurinus* s. J. Lange in *Bull. Soc. mycol. Fr.* **55** (1939), 169, which he later raised to specific rank (*Rev. Mycol., Paris,* **8** (1943), Suppl., 41) but both times without Latin diagnosis. Since I now think that *C. langei* s. R. Henry is likely to be a different fungus from that described by me in 1955 under that name, I have described mine as a new species.

Cortinarius (*Sericeocybe*) **pseudocrassus** sp.nov.

Pileus 40–100 mm., e convexo expansus, interdum umbonatus, ochraceus dein ferrugineo- vel fere fulvo-ochraceus, senectute interdum fuscotinctus, innate brunneo-fibrillosus vel eleganter fibrilloso-tomentosus, ad marginem primo forte involutus et tomentoso-fibrillosus dein vulgo laceratus. Lamellae adnatae, vulgo lineares, ex albido argillaceo-ochraceae postremo ferrugineo-argillaceae vel sordide luteolobrunneae, confertae, ad aciem ± inaequales. Stipes 40–80/10–20 mm. (ad basim 15–28) clavato-bulbosus vel fusiforme ventricosus interdum ± aequalis, albus dein hac atque illac sordide ochraceus vel rufobrunneus, sericeo-fibrilloso-striatus, ad apicem albo-pruinosus, interdum supra e cortina alba fugace annuloso-zonatus, ad basim albo-tomentosus. Caro pallide ochracea vel sordide albida, vulgo in pileo marmorata vel juxta lamellas cornea, interdum in stipite leviter obscuriore colorata, crassissima, firma. Odor et sapor fere nulli. Sporae ellipsoideo-amygdaliformes vel fusiformes, levissime punctatae, 7–9/4–5 μ. Cystidia aciei lamellarum ± lageniformia, 40–64/5–7 μ ad apicem 3–4 μ lata. Cystidia faciei lamellarum ± cylindrica vel lageniformia ad apicem subulata 30–80/5–9 μ.

In silvis, Badger Falls, Glen Affric, Inverness-shire, 6 Sept. 1957. A cystidiis, sporis parvis ± amygdaliformibus, pileo minute tomentoso insignis. Hebeloma crassum (Fr.) Ri. sensu Ricken idem est. Absentia exsiccatorum descriptionem et figuram in *Bull. Soc. mycol. Fr.* **64** (1948), p. 19, fig. 4, typum designo.

For description in English see *Cortinarius* II (p. 112), easily recognizable by the cystidia and relatively small ± amygdaliform spores and by the dry minutely tomentose or innately brown-fibrillose cap. This is *Hebeloma crassum* (Fr.) Ricken s. Rick. but not *C.* (Phlegmacium) *crassus* Fr. s. Fries, which is viscid when young, without cystidia and with larger spores, but rather similarly coloured and with innately fibrillose cap. Ricken's fungus was renamed *C. pseudocrassus* by Josserand in *Bull. Soc. mycol. Fr.* **64** (1948), 19, Fig. 4, but without Latin diagnosis. Having unfortunately lost my 1957 collection recorded above, I designate this excellent description and figure the type of *C.* (S.) *pseudocrassus*.

Cortinarius (*Dermocybe*) **cinnamomeoluteus** sp.nov.

Pileus 8–50 mm., e convexo vel conico-convexo expansus, vulgo acute vel obtuse umbonatus, rariore senectute ad discum depressus, citrinus vel olivaceo-luteus dein olivaceo-luteolobrunneus, rariore senectute ad discum rubrobrunneo-tinctus, ad marginem diu citrinus, juxta marginem innatofibrillosus vel squamis parvis fibrillosis leviter revolutis obtectus, ad discum interdum glaber sericeo-nitidus. Lamellae adnatae, diu citrinae vel olivaceo-luteae, postremo luteo- vel olivaceo-ferrugineae, subconfertae, L 20–40 l (1)3–7, ad aciem concoloratae vel persistanter luteae interdum leviter flocculosae. Stipes 20–110/1½–10 mm., aequalis vel infra leviter incrassatus, vulgo flexuosus, citrinus dein ± olivaceoluteus, interdum infra olivaceo-brunnescens, fibrilloso-striatus, ad apicem leviter luteo-pruinosus, farctus dein cavus, ad basim citrino-tomentosus; cortina citrina vel olivaceo-lutea vulgo fugacis. Caro citrina intus pallidiore citrina. Odor raphanoideus, sectus magis olet. Sporae 7½–10(11)/4½–5½(6) μ, ellipsoideae vel leviter amygdaliformes punctatae. Acies lamellarum fertilis. Intra cellulas tramae lamellarum corpuscula pigmenti lutei adsunt.

In silvis: Elstead, Surrey, 13 Oct. 1955; Studland, Dorset, 27 Oct. 1955 (typus in Herb. Kew.). A C. cinnamomeo et sociis coloribus citrino-luteis magis persistente, sporis leviter majoribus differt. C. cinnamomeus (L. ex Fr.) Fr. sensu Bresadola (iconem non descriptionem) et Dermocybe cinnamomea (L. ex Fr.) Wünsche sensu Ricken idem censeo.

For description in English see *Cortinarius* II (p. 134) except for reddish brown colour attributed to stem. Distinguished from *C. cinnamomeus* s. Fr. by lemon- or olive-yellow colours persisting in gills and cap and slightly larger spores. This seems to me to be the fungus described by R. Henry as *C. cinnamomeolutescens* in *Bull. Soc. mycol. Fr.* **55** (1939), 289; **74** (1958), 401, but without Latin diagnosis, but in case of error on my part I am describing my fungus as a new species. In Britain it is particularly abundant in damp woods under willows or alders.

CREPIDOTUS

Despite Pilát's key (these *Trans.* **33** (1950), 240–249), identification of British species of *Crepidotus* is still not easy, since some of them are not included in that key. I therefore venture to give an annotated key to those species found in Britain in recent years, together with a few others likely to be found in the future (names in brackets). Before the key can be used, information is required on colour of spore print (of reasonable depth), size and shape of spores, preferably from spore print, and in some cases examination under oil to see whether the spores are smooth or rough. It is a good plan to place these agarics soon after collection and still attached to the substrate if possible, gills downwards on a slide enclosed in a tin overnight. Next morning there will usually be a print of sufficient depth to see the colour with ease by placing the slide on white paper and the spores are ready for examination under the microscope. With the exception of *C. phillipsii*, *C. calolepis* and the gelatinous *C. mollis* it is rarely advisable or indeed possible to name these agarics in the field or without spore examination. Marginal cystidia are liable to be very variable in shape on one and the same gill and are rarely diagnostic.

Key to Crepidotus *and some species in related genera*

1. Small (cap 3–8 mm.) with short but distinct lateral stem; gills and smooth cap pale pinkish brown; growing on *Carex* or grass debris especially in wet places; spores pale clay-rusty in mass, 5–7/3–4 μ, ellipsoid-ovoid; not uncommon *phillipsii*

1. Not so; if with short but distinct stem and small, then habitat, colour or other characters different; or if basidia 2-spored see *Naucoria rubi*, p. 310 **2**

  2. Cap with distinct rusty or reddish fibrillose scales **3**

  2. Cap smooth, tomentose or villose, never rusty or reddish **5**

3. Cap without gelatinous layer, margin with white denticulate scales from veil, 5–15 mm., fibrillose-rimose, covered with small ferruginous scales; basidia 2-spored; spores 8–10/6–7 μ, broadly ovoid (smooth sub immers.; colour of spores in mass not known); gills pallid-buff then ochraceous or dark ferruginous, edge strikingly serrate-fimbriate; flesh light yellow; on log of *Tilia europaea*, Killarney *hibernianus*

3. Cap either with distinct gelatinous layer or with only the cuticle gelatinized, without distinct veil scales; basidia 4-spored; spores 7–10/5–7 μ, broadly ellipsoid-ovoid or ellipsoid (smooth sub immers.), snuff-brown in mass **4**

  4. Cap relatively large, 15–60 mm., gelatinous layer thick and distinct (easily seen if cap is pulled apart sideways); scales when present generally rather large and scattered; spores (6½)7–9(10)/5–6 μ, ellipsoid; very common *mollis*

  4. Cap relatively small, 5–15 mm., gelatinous layer thin or only the cuticle gelatinized (examine moist fruit bodies); scales rather dense and minute, scattered at margin in expanded caps; spores 7–10/5–6½(7) μ, broadly ellipsoid-ovoid; flesh thick, rather tough when dry, somewhat brittle when moist; on twigs (ash etc.); uncommon *calolepis*

5. Cap with gelatinous layer (easily seen if cap is pulled apart sideways); often fairly large, 15–60 mm.; spores snuff-brown in mass; very common *mollis*

5. Cap without gelatinous layer **6**

6. Basidia 2-spored; spores 8–10/5–6 μ, broadly ovoid, smooth; gills pallid-buff then ochraceous or dark ferruginous snuff-brown in mass; cap *ca.* 15–30 mm., dull brown, minutely tomentose; on twigs etc.; uncommon *haustellaris*

6. Basidia 4-spored; spores otherwise **7**

7. Spores 7–9(10)/2½–3½ μ, lanceolate-fusiform (Fig. 265), pale ochre-buff in mass (no pinkish tinge) *herbarum**

7. Spores otherwise, in mass usually deeper in colour **8**

8. Cap very small, 2–6 mm., pale vandyke or sepia sometimes with dirty yellowish margin; gills distant, whitish then dirty clay or pale dirty brownish or yellowish; spores globose apiculate, 5–6½ μ, warty-punctate sub immers. (Fig. 381, from specimens from type locality on beech bark kindly collected for me on 4 Jan. 1960 by Miss B. Harthan; exact colour of spores in mass not known); on deciduous wood or bark; uncommon *wakefieldiae*

8. Cap white or yellowish, usually larger **9**

9. Spores in mass clay-pink or with pinkish tinge (usually also seen on mature gills); usually small, cap 5–20 mm., rarely larger **10**

9. Spores in mass buff or snuff-brown (no pinkish tinge); cap 4–45(70) mm. **15**

10. Spores subglobose or shortly ovoid, minutely prickly (easily seen under 1/6th), 6½–8(9)/5–7 μ (Fig. 256); cap white or whitish, 4–20 mm.; common *cesatii*

10. Spores ellipsoid-oblong or ellipsoid-amygdaliform; (cap turning yellowish in *luteolus*) **11**

11. Spores pure salmon-pink in mass; taste and smell sometimes strong mealy (like *Clitopilus prunulus*) **12**

11. Spores clay-pink, pinkish snuff or pallid pinkish buff in mass (pinkish tinge may not be noticeable in thin deposit, which may appear pale ochraceous-buff); taste and smell none or faint, not mealy **13**

12. Spores subglobose or ellipsoid, angular in outline (like other Rhodophyllaceae) *Claudopus*

C. parasiticus, cap white; spores subglobose angular or cruciform, 10·5–13·2/8–10 μ sec Romagnesi; often with short stem, which is at first central but later excentric; *C. depluens*, cap hoary greyish or pinkish, spores broadly ellipsoid-angular, 10–12/7–8½ μ (Fig. 239); *C. byssisedus*, cap greyish with silky sheen, spores ellipsoid-oblong angular, 9½–12/6–7 μ (Fig. 240)

12. Spores ellipsoid-amygdaliform with 7–12 longitudinal ribs (best seen end-on sub immers.), 6–9(10)/4–5½ μ (Fig. 242); gills often remaining whitish for a long time, finally pinkish; taste like *Clitopilus prunulus*; on twigs, logs or herbaceous stems or dead leaves; not uncommon *Clitopilus hobsonii*†

* This common small agaric has received many names (see 'List') but has spores of a shape unique in this genus in Britain as yet and relatively pale in the mass, so that it may be (and certainly has been!) mistaken for a species of *Pleurotellus* (i.e., a small species of *Pleurotus* sensu lato with white spores). A sufficiently deep print shows very definite colour, and I think it better to include this agaric in *Crepidotus* and not in *Pleurotellus*, which I prefer to restrict to species with white spore print. The second set of spore measurements (7–8/3–3½ μ) given by Pearson indicate that he included this in *C. pubescens* (these *Trans.* **32** (1949), 268), his record, therefore, being a composite one. *C. herbarum* is always small and has cap 3–15 mm. white, reniform or orbicular, pubescent, gills white then pale ochre-buff and when young may have a short white recurved stem; on plant debris of various kinds, especially leaves and herbaceous stems.

† Like *Crepidotus herbarum* this is another small agaric which has received several names and has been frequently misidentified in the past as a species of *Pleurotus*, *Claudopus* or *Crepidotus*; the mealy taste and ellipsoid-amygdaliform spores pure pink in the mass are, however, readily recognizable and it is not always necessary to see the longitudinal ribs on the spores sub immers. (full description, p. 188)

13. Cap soon turning yellowish; spores 7–10(11)/3½–5 μ, narrowly ellipsoid-amygdaliform (Fig. 264), smooth or very minutely punctate sub immers.; common and widespread *luteolus*

13. Cap white or whitish; spores otherwise **14**

 14. Spores 5–7/3–3½ μ, ellipsoid-oblong (Fig. 262), minutely spiny-warty sub immers.; common *variabilis*

 14. Spores 7½–10/4½–5½ μ, ellipsoid-amygdaliform, distinctly rough sub immers. (*C. epibryus* (Fr., 1821) Kummer, 1871 s. Pilát (*Atlas Crepidotus*, 66, Fig. 21) not authentically British)

15. Gills pale but distinctly lemon-yellow at first, then deeper lemon, finally becoming clay-olive or snuff-brown; spores 6–8/4½–5½ μ, broadly ellipsoid, smooth sub immers. (Fig. 380) *sambuci**

15. Gills white or whitish at first then clay-buff or snuff-brown; spores various **16**

 16. Spores globose, subglobose or broadly ovoid, minutely punctate or spiny-warty sub immers. **17**

 16. Spores broadly ellipsoid to ellipsoid-amygdaliform or tear-drop shape, smooth sub immers. (except in *subtilis* they are very minutely punctate) **18**

17. Spores globose apiculate, minutely punctate or spiny-warty sub immers., (4)5–6½ μ (Fig. 258); cap often larger, 5–32 mm.; not common *applanatus*

17. Spores subglobose or shortly broadly ovoid, minutely spiny-warty sub immers., 5½–6½(7)/4½–5 μ (Fig. 259); cap usually small, 5–15 mm.; not common *subsphaerosporus*

 18. Spores ellipsoid-amygdaliform, amygdaliform or tear-drop shape (Figs. 254, 255, 261); cap 7–50(70) mm., either persistently white or whitish or discolouring yellowish **19**

 18. Spores ellipsoid or broadly ellipsoid (Figs. 257, 260); cap 5–20 mm., white or whitish not discolouring yellowish; (probably uncommon) **21**

19. Spores ellipsoid-amygdaliform to distinctly amygdaliform, 6–8(8½)/4–6 μ (Fig. 254); cap 9–40 mm., often discolouring yellowish or dirty cream; not uncommon on twigs or other plant material *amygdalosporus*

19. Spores ellipsoid-amygdaliform or tear-drop shape, on the whole longer, 7–10½/4½–6 μ (Figs. 255, 261); cap 5–50(70) mm., either persistently white or whitish or discolouring yellowish **20**

 20. Cap 20–50(70) mm., sometimes tinged yellowish or ochraceous in places; spores 7–10/4½–6 μ, ellipsoid-amygdaliform or tear-drop shape (Fig. 255); fragile, sometimes growing on the ground; not common *autochthonus*

 20. Cap 5–25 mm., persistently white or whitish; spores 8–10½/4½–5½ μ, ellipsoid-amygdaliform (Fig. 261); on twigs, fern-sheaths or other plant debris; uncommon *pubescens*†

21. Spores mostly 4–5 μ broad, ellipsoid, smooth sub immers., 6½–8½/4–5(5¼) μ (Fig. 263) (*C. lundellii*‡ Pilát apud Lundell, 1936)

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* Found on *Fraxinus* twigs, Whitlands Landslip, Rousdon, Devon, 26 Nov. 1958; cap 7–25 mm., white then whitish or tinged slightly lemon in places, minutely tomentose; marginal cystidia cylindric-flexuose often capitate or lageniform 36–64(82)/6–10 μ, apex 4–8(10) μ, or clavate 12–15 μ diam.; agrees with Latin diagnosis of *C. sambuci* Vel., 1921, and I have ventured to record it as such.

† The spores of my collections range to ½ μ broader than the breadth given by Bresadola and ½ μ narrower than given by Pilát for his *C. bresadolae* (an unnecessary new name for *C. pubescens* Bres.); the measurements of Bresadola's and Pilát's drawings do not agree with those given in the text by these authors, being narrower, considerably so in those of Pilát; my collections may therefore belong to another species, but are included as *C. pubescens* for the present.

‡ Type material of *C. lundellii* (*Fungi Exsicc. Suec.* no. 220) now in the British Museum (Nat. Hist.), South Kensington, has ellipsoid spores, smooth sub immers., 7–8½/4½–5(5¼) μ, agreeing well enough with the measurements given in the original diagnosis (6½–8/4–5 μ); in later works Pilát has given considerably larger dimensions for the spores of *C. lundellii* (7–10·5/5·8–7·5 μ) presumably in error or because he had examined another species; the shape was originally given as 'subfusoideae' but altered in later works by

21. At least a fair proportion of spores more than 5 μ broad **22**
  22. Spores 7–9(10)/5–6 μ, ellipsoid or broadly ellipsoid, very minutely punctate sub immers. (Fig. 260); cap soon smoothly silky except at point of attachment; (see below) *subtilis*
  22. Spores 6–8/4½–5½ μ, rather broadly ellipsoid, smooth sub immers. (Fig. 257); cap persistently tomentose *inhonestus**

Crepidotus subtilis sp.nov. (Fig. 260)

Pileus 5–14 mm., reniformis vel orbicularis, laterale vel excentrice affixus, albus haud decolorans, mox aliquantum glabro-sericeus praeter ad locum albo-villoso tomentosum affixationis, ad marginem diu involutus. Lamellae in loco excentrico concurrentes, pallide albido-argillaceae dein argillaceo-luteolobrunneae, postremo argillaceo-fuscae, subconfertae, L 12–18 l (0) 1–7, ad aciem primo manifeste albo-flocculosae. Stipes nullus. Caro tenuissima alba. Sporae ellipsoideae, raro subtillissime amygdaliformes, 7–9(10)/5–6 μ (Fig. 260), minutissime punctatae sub immers. (Fig. 260), in cumulo argillaceo-fuscae. Basidia 4-sporigera, 30–39/7–8 μ. Cystidia aciei lamellarum clavato-capitata vel cylindrico-flexuosa, vulgo infra incrassata vel fere lageniforma, 36–72/4–8 μ, ad apicem 5–19 μ. Hyphae cuticulae pilei hyalinae, filamentosae, fibulatae, 4–8 μ latae.

Ad ramos dejectos Sambuci et Hederae, Whitlands Landslip, Rousdon, Devon, 2 Dec. 1958 (typus in Herb. Kew.). Sporis ellipsoideis in cumulo argillaceo-fuscis, pileo albo parvo insignis.

Cap 5–14 mm., reniform or orbicular, attached laterally or excentrically, *white hardly discolouring*, soon rather smoothly silky except at villose-tomentose point of attachment, margin often remaining incurved for some time. *Gills* meeting at a very excentric point, pale clay-whitish then clay-buff finally *snuff-brown*, fairly crowded L 12–18 l (0) 1–7, edge conspicuously white flocculose at first. *Stem* none. *Flesh* very thin, white. *Spores ellipsoid* or very slightly amygdaliform, *7–9(10)/5–6 μ* (Fig. 260), smooth or very minutely punctate sub immers. (Fig. 260), *snuff-brown* in mass. *Basidia* 4-spored 30–39/7–8 μ. *Marginal cystidia* clavate-capitate or cylindric-flexuose often slightly swollen below to almost lageniform, 36–72/4–8 μ, apex 5–19 μ. Hyphae on cap hyaline, filamentous interwoven, clamped, 4–8 μ diam.

On elder and ivy twigs, Whitland Landslip, Rousdon, 26 Nov. 1958 and 2 Dec. 1958 (the latter is the type in Herb. Kew); Dowlands Landslip, Rousdon, 29 Nov. 1958. Recognized amongst the snuff-brown spored Crepidoti by the almost smooth ellipsoid spores and small white cap.

Pilát to 'ellipsoide-subamygdalines'; the epithet *lundellii* must be retained for specimens with spores agreeing at least approximately in size and shape with those of the type material, however, since spore size and shape are so critical in this genus; there is no evidence of such specimens in Britain as yet.

* Found on ivy twigs, Bindon Landslip, Rousdon, Devon, 29 Nov. 1958; cap 4–12 mm., white hardly discolouring, silky-tomentose, villose-tomentose at point of attachment; gills clay-whitish then pale clay-snuff to snuff-brown; edge often conspicuously whitish flocculose-denticulate; marginal cystidia cylindric-flexuose or irregularly capitate-clavate sometimes also swollen below, 36–70/6–10 μ, apex 5–12(15) μ; spores of type material kindly sent from Finland are 6–8/4½–5½ μ, smooth and shaped as in my collection (Fig. 257*a*); judging by spore details given, this is also *C. versutus* var. *subglobisporus* Pilát (*Acta Mus. nat. Prague* **2** B (1940), 74) and *C. lundellii* var. *subglobisporus* (Pilát) Pilát (*Atlas Crepidotus* (1948), p. 50).

Cystoderma simulatum sp.nov. (Figs. 13–15, 385)

Pileus 18–25 mm., e convexo expansus, obtuse umbonatus, obscure ochraceo-luteolo-brunneus dein fulvo- vel ferrugineo-tinctus, postremo rufo-fulvus ad marginem ochraceo-luteus vel totus fulvo-ochraceus, totus pallide ochraceo granuloso-farinaceus, interdum ad discum rugulosus, ad marginem e velo granuloso appendiculato lacerato-dentatus. Lamellae adnatae, ex albo cremeae vel pallide luteae, senectute praecipue ad marginem obscuriore luteae, confertae, L 32–40 l 3–7, ad aciem leviter vel fortiter inaequales. Stipes 35–50/2½–5 mm., aequalis vel ad basim incrassatus, pallido-ochraceus, ad apicem interdum lutescens, dein ochraceascens, supra minute sericeo-striatus, infra e velo pallido-ochraceo annuloso-zonatus et transversim squamulosus, farctus dein anguste cavus, sine annulo membranaceo. Caro pallide lutea, infra in cortice stipitis ochracea, intus alba. Odor nullus vel debilis. Sporae subglobosae vel late ovoideae, 3½–5/2½–3½ μ (Fig. 385), amyloideae. Basidia 4-sporigera, 22–25/4–5 μ. Acies lamellarum fertilis sed hac atque illac cellulae cylindricae vel flexuosae ad apicem subinde incrassatae (3–5(6) μ latae) 12–40 μ exstant. Cellulae veli pilei globosae vel irregulariter vesiculosae 14–44 μ latae; cellulae veli stipitis similes.

Gregarius vel caespitosus; ad ramos putridos Sambuci vel inter lignum putridum ad solum; Tuck's Plantation, Surlingham, Norfolk, 12 Oct. 1957 (typus in Herb. Kew.). A C. amianthino sporis subglobosis probabiliter etiam habitatione et coloribus obscurioribus, a C. fallace absentia annuli membranacei differt.

Cap 18–25 mm., convex then expanded, obtusely umbonate, deep ochre-buff then tinged tawny or rusty, *finally reddish tawny with ochre-yellow margin or entirely tawny-ochraceous*, *entirely pale ochraceous granular-mealy*, sometimes becoming rugulose at centre, margin lacerate-dentate from appendiculate granular veil at first. *Gills* adnate, white soon creamy or pale yellowish, deeper yellow when old, especially at the edge, crowded, L 32–40 l 3–7, edge concolorous, slightly to very uneven. *Stem* 35–50/2½–5 mm., equal or thickened at base, pale ochraceous sometimes with brighter yellowish tint at apex then deeper ochraceous, upper part smooth but minutely silky-striate, *pale ochre veil forming ring-zone and ± concentric zones of scales on lower part* (no membranous ring), stuffed then narrowly hollow. *Flesh* pale or dirty yellow in cap, dirty yellowish in stem cortex, deeper ochraceous at the base, white in centre of stem. *Smell* faint pleasant or none. *Spores subglobose or broadly ovoid*, 3½–5/2½–3½ μ (Fig. 385), amyloid. *Basidia* 4-spored, 22–25/4–5 μ. *Gill edge* fertile but with some cylindric or flexuose cells projecting 12–40 μ in places, occasionally slightly swollen at apex (3–5(6) μ). Cells of veil on cap globose or irregularly vesiculose, 14–44 μ diam., walls smooth, slightly thickened. Veil on stem of similar cells.

Gregarious or caespitose on rotten elder wood or on soil amongst very rotten wood. Tuck's Plantation, Surlingham, 12 Oct. 1957 (type in Herb. Kew). *C. amianthinum* differs in having ellipsoid-oblong spores (4½)5–7/2½–3½ μ (Fig. 382) and probably also in habitat (soil) and paler colours. The spores of *C. simulatum* are similar to those of *C. fallax* A. H. Smith & Singer, but this differs *inter alia* in having a distinct membranous ring.

DECONICA

I have frequently been puzzled by the diverse accounts of the epithets included in this genus and have come to the conclusion that some sorting out is necessary. The chief source of confusion seems to be the many and varied interpretations of *atrorufa* and *physaloides* and descriptions lacking information on some essential characters. The former was used by Fries as *Agaricus* (*Psilocybe*) *montanus* β *A. atrorufus* in *Systema*, I (1821), 293, where the only difference given between it and *A. montanus* ('stipite glabro') is 'stipite longe fibrilloso'. In *Epicrisis* (1838), p. 230, *atrorufus* is raised to a species and *montanus* becomes *A. atrorufus* b. *montanus* ('stipite brevi glabro'). Provisionally I have included *atrorufa* s. Ricken and J. Lange in the 'List' as *D. montana*, the descriptions of these authors agreeing reasonably well with Fries's original diagnosis of *A. montanus*, especially 'pileo subspadiceo', 'pileus humidus, striatulus, siccus laevis, 2–4 lin. latus, expallens alutaceus, pallescens', 'stipite brevi, glabro' and 'stipes pileo concolor'. The epithet *physaloides* was taken by Mérat (*Nouvelle Flore* (1821), p. 64) from *A. physaloides* Bulliard. In his description Mérat describes the cap as 'd'abord ovoide puis en cloche et enfin concave, arrondi, rougeâtre ou fauve, glabre, sans stries'; the gills as 'rouxs ou fauve, très longs, décurrents sur le pedicule' and the stem as 'glabre...du même couleur que le chapeau'. The habitat is 'ordinairement solitaire, dans les endroits secs humectés'. There is no mention of viscidity. I doubt if we shall ever know for certain which fungus is thus diagnosed. However, the interpretation of J. Lange of *physaloides* seems to come nearest to this, especially its colours, non-striate cap and smooth stem, even though the gills can scarcely be said to be 'très longs'. Furthermore, the absence of viscid pellicle is stressed by Fries for *physaloides* in *Monographia*. I have therefore kept *physaloides* in the 'List' sensu J. Lange. *Agaricus bullaceus* Fr. is more clearly diagnosed by Fries as having a striate cap with separable viscid pellicle and appendiculate veil. As the interpretation of Ricken agrees quite satisfactorily with this *bullacea* is included in the 'List' in this sense. There are other interpretations of all these epithets and I have found it necessary to introduce one new species and two provisional names to deal with these.

I believe the presence or absence of a viscid separable pellicle on the cap to be a useful means of separating the species if combined with some quite clear spore size differences, but unfortunately none of these details are given by older authors. I have felt obliged to use provisional taxa for two of my fungi included here since I have not yet made enough collections and notes on them to establish them as species, nor, indeed, enough field work on the genus as a whole. In the following key three species (names in brackets) are not yet recorded for Britain (for full synonymy see 'List').

Key to Deconica

1. Spores 12–14/6–8 μ; growing on dung *coprophila*
1. Spores smaller; not growing on dung, except sometimes *crobulus* and perhaps *bullacea* 2
  2. Cap without separable pellicle, not or scarcely viscid 3
  2. Cap with separable viscid pellicle 6
3. Cap entirely or at least in outer part greyish tomentose, sooty-brown, drying paler, convex with small umbo; stem *ca.* 15–20/1–2 mm., concolorous, everywhere fibrillose-flocculose; gills becoming concolorous rather distant, decurrent; spores broadly ovoid 6–7/4½–5 μ; marginal cystidia lageniform sometimes subcapitate (14)24–32/5–6 μ apex 3–4 μ; in grass (*libertatis* (Fr.) F. H. Møller; Møller FF 187)

3. Cap smooth or even when dry (cuticle occasionally cracked) **4**

4. Gills dark rusty, not distinctly violaceous or umber; on conifer needles; cap striate at edge only, tawny-brownish; spores 5·7–6·5/4–4·7 μ (*Geophila hyperella* (Fr.) Kühn. & Romagn. KR, *Fl. Anal.* p. 339)

4. Gills soon umber then violaceous-umber; in moss or mossy grass **5**

5. Cap striate when moist, deep date or rufous-sepia, semiglobose, more rarely with slight umbo; stem concolorous or slightly paler at apex only; spores 6–8/4–5 μ *montana* (= *atrorufa* s. J. Lange)

5. Cap striate at edge only or not at all when moist, dull bay then ochraceous-brown, convex-expanded often with small umbo; stem paler than cap, reddish brown or tinged tawny below; spores 6–7/4–5 μ *physaloides* s. J. Lange (non Møller)

6. Gills dull rusty or clay-sepia, not tinged violaceous or purplish except occasionally when quite old; spore print cigar-brown with slightly purplish tint (originally included in *Tubaria*) **7**

6. Gills soon umber or purplish brown; spore print purplish or violaceous-umber (originally in *Psilocybe*) **8**

7. Spores 5½–8/4–5/3½–4 μ; cap with small white scales from veil at first, these usually persisting at margin; on twigs, stems and other vegetable debris, occasionally on dung or sawdust *crobulus*

7. Spores 7½–10/4½–5½; cap smooth without scales, strongly striate when moist; veil slight; on grass stems or other herbaceous debris *inquilina* (s. J. Lange)

8. Spores strongly lentiform, almost rhomboid in some views, 5·5–6·5(7)/4·7–5·2/3·5–4 μ; on dead leaves, deciduous or coniferous; cap dark brown, slightly striate at edge when moist (*Geophila rhombispora* (Britz.) Kühn. & Romagn.—KR, *Fl. Anal.*, p. 338; = *Naucoria tenax* s. Ricken non al.)

8. Spores sometimes lentiform but not rhomboid, sometimes larger; in moss or amongst lichens or in grass especially where dung has been **9**

9. Spores 6–8½/4–5½/3¾–4½ μ (Fig. 386) **10**

9. Spores either 7–9½–/5–6/4½–5 μ (Fig. 383) or (9)10–13/6¾–8/6–7 μ (Fig. 384); cap striate at margin when moist **11**

10. Cap striate when moist with conspicuous dentate appendiculate veil at margin when young; spores 6–7(8)/4–4¾/3¾–4¼ μ, ellipsoid or slightly amygdaliform, lenticular (Fig. 386*a*); stem silky striate, apex with conspicuous fibrillose veil-zone at least at first; in grass especially where dung has been, also in rotten straw *bullacea* s. Ricken (= *atrorufa* s. Møller)

10. Cap not striate when moist, margin at first with slight, soon fugacious traces of veil or none; spores 6–8½/4½–5½/3¾–4½ μ, ellipsoid lenticular (Fig. 386*b*); stem smooth or slightly silky striate, without or with faint soon fugacious veil-traces at first; in mossy grass taxonomic sp. 1*

11. Spores ± amygdaliform, lenticular, 7–9½/5–6/4½–5 μ (Fig. 383); cap chestnut, date-brown, honey or ochraceous-honey when moist, drying ochraceous-yellowish or with slight tawny tinge at centre; in moss or lichens or on sand-dunes *muscorum* (= *physaloides* s. Ricken non al.; = *bullacea* s. Bresadola, ? J. Lange non Ricken)

11. Spores ellipsoid lenticular, (9)10–13/6¾–8/6–7 μ (Fig. 384); cap dark date-brown when moist drying buff or tan; in grass taxonomic sp. 2†

* This is based on a collection made from short mossy grass at the edge of a road, Mid-Yell, Shetlands, 23 July 1958. Additional features are: cap 5–20 mm., convex then expanded sometimes slightly obtusely umbonate, burnt sienna or tawny-date-brown, drying pale ochraceous from the centre, often with tawny tinge at centre, extreme margin remaining dark for a long time; gills pale then deeper umber, sometimes with slight tawny tinge, L 20–24 l (1)3; stem 18–25/1–2 mm., concolorous or paler at the apex; marginal cystidia lageniform with rather acute apex, 20–40/6–9 μ, apex 2–3 μ. May be *atrorufa* s. Kühner & Romagnesi (excl. syn.) at least in part, which is described as having a viscid pellicle (*Fl. Anal.* p. 338).

† I several times collected a small agaric from the lawns of Epsom College in 1951 and subsequently, which I at first called *D. physaloides*. This had very much larger spores

Deconica muscorum sp.nov. (Figs. 16–17, 383)

Pileus 5–16(25) mm., e convexo expansus vulgo umbonatus, interdum postremo depressus, castaneus, umbrinus, mellinus vel ochraceo-mellinus, siccitate pallide ochraceo-luteus interdum praecipue ad discum fulvo-tinctus, jove pluvio ± viscidus, pellicula separabile, nitidus et ad marginem striatus, jove sicco opacus, ad marginem primo velo albo fugace appendiculato. Lamellae adnatae vel subdecurrentes, fere planae, ex argillaceo-albido argillaceo-umbrinae postremo violaceo-umbrinae, subdistantes, L 14–20 l 1–3; ad aciem albo- vel pallide-flocculoso denticulatae. Stipes 12–30/1–2 mm., aequalis vel deorsum attenuatus, haud raro leviter bulbillosus, albidus mox ochraceo-mellinus vel ferruginascens, ad apicem pallidiore coloratus, albopruinosus, e velo albo-sericeo cortinatus et infra maculis sparsis obtectus, cavus. Caro concolorata, siccitate pallidiore colorata. Odor et sapor nulli. Sporae lentiforme amygdaliformes poro germinativo, 7–9(9½)/5–6/4½–5 μ (Fig. 383). Basidia 4-sporigera 28–34/6–7 μ. Cystidia aciei lamellarum lageniformia ad apicem aliquantum acuta, 24–42/5–10 μ ad apicem 2–4 μ.

Inter muscos lichenesque, etiam inter graminos in sabulis maritimis; Studland, Dorset, 17 Nov. 1958 (typus in Herb. Kew.). D. montana et D. physaloides a sporis minoribus absentia pelliculae separabilis ad pileum differunt. Psilocybe bullacea sensu Bresadola et probabiliter J. Lange et P. physaloides sensu Ricken a sporis idem censeo. D. bullacea a sporis minoribus velo appendiculato, pileo semiglobato fortiore striato differt.

Cap 5–16(25) mm., convex then expanded often umbonate, sometimes becoming slightly depressed, *chestnut*, *date brown*, *honey or ochraceous-honey*, drying from centre pale ochraceous yellowish sometimes with tawny tinge at centre, when moist rather viscid and shiny and striate at margin, when dry opaque, *with separable pellicle*, margin at first with a few fugacious white fibrils from veil. *Gills* adnate or subdecurrent, ± plane, clay-whitish then clay-umber finally violaceous-umber, subdistant, L 14–20 l 1–3, edge white or pale flocculose-denticulate. *Stem* 12–30/1–2 mm., equal or attenuated downwards sometimes slightly bulbillose, whitish *soon ochraceous-honey or reddish brown from base*, apex paler and white pruinose, white silky veil cortinate and forming scattered patches on lower stem, hollow. *Flesh* concolorous drying paler in centre of cap and stem. *Smell* and *taste* none. *Spores* lentiform amygdaliform with germ pore, *7–9(9½)/5–6/4½–5 μ* (Fig. 383). *Basidia* 4-spored 28–34/6–7 μ. *Marginal cystidia lageniform with rather acute apex*, 24–42/5–10 μ, apex 2–4 μ.

than *physaloides* s. J. Lange and was clearly a different species; neither did it agree with *physaloides* s. Ricken so that I later described it in my notes under the provisional name of *D. pratensis*, having by then collected *physaloides* s. J. Lange, which I thought most likely to be the original *physaloides*. Judging by spore measurements *Agaricus* (*Psilocybe*) *physaloides* s. Berk. & Cooke from the walls of the sewage filtering apparatus at Croydon seems likely to be the former also; I have examined material now in Herb. Kew collected at Croydon in 1852 and found the spores to be ellipsoid lenticular, 10–13/7–8/6–7 μ (Fig. 384*a*). In the absence of dried material gathered by me I have postponed describing this as a new species, but this may be necessary because I cannot find anything corresponding to it in current literature. I have also collected this agaric from other chalk grassland in Surrey but have unfortunately no details of these collections. Here is a brief description of a collection from Epsom College, Epsom, Surrey, 21 Nov. 1951 in grass. *Cap* 10–20 mm., dark date-brown, more or less viscid and striate at the edge when moist, drying buff or tan colour; *gills* bay or umber with slight purplish tinge, paler or almost olivaceous when young, not crowded, L 14–18 l 3(7); *stem ca.* 15–20/1½–2 mm., dirty brownish, apex slightly striate from gills, pale fibrillose-pruinose all over when fresh; *spores* (9)10–12/6¾–7¾/6–7 μ (Fig. 384*b*); *basidia* 4-spored; *marginal cystidia* lageniform, *ca.* 30/7–10 μ, apex 3–4 μ diam.

In moss and lichens or in grass in sand-dunes; Studland, 17 Nov. 1958 (type in Herb. Kew); on burnt mossy ground, Elstead, Surrey, 2 Nov. 1952; Studland, 28 Nov. 1951 (legit T. J. Wallace); Dawlish Warren, Devon, 30 Oct. 1953, 20 Jan. 1954 (legit T. J. Wallace). Differs from *D. montana* and *D. physaloides* in the separable viscid pellicle and larger spores. From spore details this is *Psilocybe bullacea* s. Bresadola and probably J. Lange and *P. physaloides* s. Ricken. *D. bullacea* (s. Fries, Ricken) differs in smaller spores, appendiculate veil at first and habitat. Since Fries did not describe a separable pellicle for either *montana* or *physaloides* (or *atrorufa*) I prefer to retain these epithets for agarics without this feature; Fries did give *bullacea* as having a separable pellicle, but since the features of the fungus I have described above do not agree with accepted conceptions of either *bullacea* or *physaloides* a new epithet has been chosen.

Dermoloma josserandii Dennis & P. D. Orton sp.nov. (Figs. 379, 514)

Pileus (20–)25–(50) mm., e convexo expansus, griseo-fuscus siccitate pallidiore griseus, jove pluvio exstriatus, jove sicco minute atomatus. Lamellae subdecurrentes vel adnatae dente decurrentes (Fig. 514), sordide albidae vel pallide griseae, distantes, aliquantum crassae. Stipes (25–)48–(65)/4–(10) mm., deorsum attenuatus (rariore ad basim incrassatus) interdum tortus (ex albo) sordide albidus vel pallide sordide ochraceo-tinctus, sericeo-striatus. Caro albida vel pallide grisea. Odor et sapor forte farinacei. Sporae late ellipsoideae vel ovoideae, 6–8/4½–5½ μ (Fig. 379), amyloideae. Basidia 4-sporigera. (Cellulae cuticula pilei spheropedunculatae, pyriformes vel clavatae, 8–22 μ diam.)

In silvis. Hawkridge, Spaxton, Somerset, 15 Sept. 1958 (legit Mrs Marriage, typus in Herb. Kew.). D. atrocinereum colores similes habet sed a lamellis numquam decurrentibus, sporis amyloideis, D. cuneifolium a lamellis numquam decurrentibus sporis leviter angustioribus coloribus magis brunneis differunt.

Cap (20–)25–(50) mm., convex then expanded, *grey-horn colour*, *drying paler*, minutely atomate when dry, not striate when moist. *Gills subdecurrent* or adnate with a tooth (sometimes emarginate), dirty whitish or pale grey, distant, rather thick. *Stem* (25–)48–(65) mm., attenuated downwards (occasionally slightly thickened at base), (white then) dirty whitish or tinged pale dirty ochraceous, silky striate (sometimes twisted). *Flesh* whitish or pale greyish. *Smell* and *taste strong mealy*. *Spores* broadly ellipsoid or ovoid, 6–8/4½–5½ μ (Fig. 379), *amyloid*. *Basidia* 4-spored. Cap cuticle cellular (cells spheropedunculate, pyriform or clavate 8–22 μ diam.). (Apex of stem with clavate cells which later become reflexed, 10–16 μ diam.—not seen in British material).

In birch and beech wood, Hawkridge, Spaxton, 15 Sept. 1958 (legit Mrs Marriage, type in Herb. Kew). Differs from *D. atrocinereum* in ± decurrent gills and amyloid spores and from *D. cuneifolium* in ± decurrent gills, slightly broader spores and greyer colours. This seems to be the same as *Tricholoma hygrophorus* Josserand (*Bull. Soc. mycol. Fr.* **74** (1958), 486), published without Latin diagnosis. We have therefore renamed it *josserandii* in recognition of the excellent description given by him; some details (in brackets above) are quoted from his description. I gathered a fungus at Weeting Breck, Norfolk, on 2 Oct. 1958, very likely *D. josserandii*, but unfortunately no notes were made at the time and this record cannot yet be accepted as definite.

ECCILIA NIGELLA Quél., *C.R. Ass. franc. Av. Sci.* 1883, 2, Pl. 6^6 (Figs. 209–210, 266)

In the sand-dune area of Dawlish Warren, Devon, T. J. Wallace collected a small dark brown agaric which resembled a small species of *Omphalina*, such as *O. rustica* s. J. Lange, very closely macroscopically but had angular spores, pink in the mass and elliptic-oblong in outline (Fig. 266), thus ruling out the possibility of its being *E. rusticoides*, which is generally accepted as having isodiametric spores subcircular in outline $7\frac{1}{2}$–10/$6\frac{1}{2}$–$7\frac{1}{2}$ μ (Fig. 267). The spores were also larger than those of *E. parkensis*, as currently described, and in any case the latter differs macroscopically from the Dawlish Warren agaric in some details. Whilst looking at some of Quélet's figures for another purpose I saw that he had described from sand-dunes on the island of Oleron *E. nigella*, a small species looking much like the Dawlish Warren agaric, and having spores 'ovoide anguleuse, 10 μ'. The Dawlish agaric agreed reasonably well with the original description and I have therefore included *E. nigella* Quél. in the 'List'. The following is a brief description of the British material taken mainly from notes of T. J. Wallace:

Cap 7–18 mm., convex then expanded-convex, centre not or slightly depressed, *dark brown with conspicuous striae when moist*, smooth but innately radially silky-fibrillose under lens, margin often crenate or uneven. *Gills concolorous* then with slight pink tinge, decurrent, triangular, *distant*, L 9–14 l 0–2, thick, occasionally forked, edge even. *Stem* 10–20/1–2 mm., equal or attenuated downwards, ± *concolorous*, *smooth* (one specimen had compressed grooved stem), base not seen, white tomentose. *Flesh* thin, concolorous. *Spores* angular *ellipsoid-oblong*, 10–12/7–8 μ (Fig. 266). *Gill edge* fertile. *Basidia* 4-spored. Hyphae of cap surface ± cylindrical, 8–30 μ diam., pigment encrusting, sometimes 'zebrée'. No clamps seen.

In moss and lichen, Dawlish Warren, Devon, 12 Dec. 1956, legit T. J. Wallace.

Eccilia paludicola sp.nov. (Figs. 387, 407, 512, 513)

Pileus 6–27 mm., e convexo mox expansus profunde umbilicatus, fuscus vel colore cornus tinctus vulgo ad discum obscuriore coloratus, jove pluvio fere totus striatus, jove sicco pallide fuscus, semisiccitate conspicue radialiter obscuro-lineatus, ad marginem diu involutus et crenatus. Lamellae longe decurrentes, pileo expanso emarginato-decurrentes, primo colore cornus tinctae vel griseofuscae dein sordide incarnatae vel incarnato-brunneae, subconfertae, L 14–20 l (1)3(7), ad aciem integrae. Stipes 20–37/1–2 mm., aequalis vel deorsum leviter attenuatus vulgo flexuosus, pallide fuscus vel colore cornus tinctus, vulgo supra obscuriore coloratus, glaber, fragilis, e farcto cavus, ad basim albo-tomentosus. Caro tenuissima albida, in cortice stipitis pallide fusca. Odor nullus vel fracta farinaceus; sapor farinaceus dein ingratus. Sporae late ellipsoideae angulatae, 8–10(11)/$5\frac{1}{2}$–7 μ (Fig. 387). Basidia 4-sporigera. Acies lamellarum fertilis. Hyphae cuticulae pilei intus vulgo conspicue nigro granuloso-pigmentatae (Fig. 407), 5–12 μ latae.

In paludosis salicetis, Amberley, Sussex, 25 May 1959 (legit D. A. Reid, typus in Herb. Kew.). A Leptonia polita lamellis longiore decurrentibus primo griseofuscis, sapore farinolente, a Rhodophyllo caccabo Kühner sporis formae alterae differt.

Cap 6–27 mm., convex soon *expanded deeply umbilicate*, sepia or sepia-horn often with darker vandyke centre, drying pale sepia in radial bands, *strikingly radially darker streaky in outer part* when half dry, striate to centre when moist, margin often rather persistently incurved and crenate. *Gills* deeply decurrent, emarginate-decurrent when cap has expanded, *grey-sepia or grey-horn* then dirty pinkish or pinkish brown, subcrowded, L 14–20 l (1)3(7), edge concolorous ± even. *Stem* 20–37/1–2 mm., equal or slightly attenuated at base, often flexuose, pale sepia-horn often darker above, smooth, fragile, stuffed then hollow, base white tomentose. *Flesh* very thin whitish, sepia-horn in stem cortex. *Smell* none or *mealy* when cut. *Taste mealy* then nasty (rather rancid-garlic). *Spores* broadly ellipsoid angular, 8–10(11)/5½–7 μ (Fig. 387). *Basidia* 4-spored. *Gill edge* fertile. Hyphae of cap cuticle often with *dark black-brown granular pigment bodies inside cells*, sometimes almost filling the cell (Fig. 407), 5–12 μ diam.

Under *Salix* sp. on wet ground, Amberley, 25 May 1959 (legit D. A. Reid, type in Herb. Kew). Differs from *Leptonia polita* in gills at first grey-horn or grey-sepia and more distinctly decurrent, mealy taste and dark granular pigment in cap cuticle hyphae; *Rhodophyllus caccabus* Kühner appears similar macroscopically but has consistently longer spores and a different habitat. The nasty after-taste is the same as that I have experienced with *Entoloma sericatum*, *E. nidorosum* and *Leptonia pernitrosa*, whether this indicates affinity or not remains to be shown.

Entoloma fuscomarginatum sp.nov. (Figs. 18–19, 269, 411)

Pileus 15–50 mm., e convexo expansus interdum postremo depressus, vulgo umbonatus (umbone vulgo parvo obtuso), fuscus vel colore cornus tinctus ad discum obscuriore brunneus, siccitate leviter pallidiore coloratus, primo totus fibrillis sericeis minutis obtectus, et ad discum fere tomentosus dein senectute vel jove pluvio glabrescens, jove sicco manifeste sericeo-canus. Lamellae adnatae ± emarginatae, primo pallido-griseae vel colore cornus tinctae dein sordide- vel brunneo-incarnatae, subdistantes, L 22–30 l 1–3, ad aciem distincte obscuriore brunneo-flocculosae. Stipes 25–54/2–6 mm., aequalis interdum supra vel infra incrassatus vel ad basim clavato-incrassatus, pileo concoloratus vel supra pallidiore coloratus, ad basim albus vel pallido-cremeus, sericeo-fibrilloso striatus vel interdum corneo-lineatus, e farcto cavus. Caro pilei obscure brunnea, stipitis alba vel albida in corticem colore cornus tincta. Odor farinaceus, sectus magis olet. Sapor farinaceus. Sporae ellipsoideo-oblongae angulatae, 9–12(13)/6½–8 μ (Fig. 269). Basidia 4-sporigera, 38–46/10–12 μ. Cystidia aciei lamellarum fusiforme-clavata vel lageniformia vulgo cervice aut breve aut longa, ad apicem interdum capitata, vulgo inclusione brunneola, 36–72/10–25 μ ad apicem 3–5 μ vel ubi capitata 6–8(10) μ lata (Fig. 411). Hyphae cuticulae pilei 6–16 μ latae non incrustato-pigmentatae vel 2–10 μ latae incrustato-pigmentatae.

Inter Sphagnos vel in locis turfosis: Tomich, Inverness-shire, 18 Sept. 1958 (inter Sphagnos; typus in Herb. Kew.), 24 Sept. 1958 (in ericetis); West Sandwick, Yell, Shetlands, 3 Sept. 1952 (ad solum turfosum, legit R. W. G. Dennis); Holt Lowes, Norfolk, 5 Oct. 1958 (inter Sphagnos, legit J. T. Palmer). E. helodete proxime accedit, sed a pileo sericeo-fibrilloso acie lamellarum obscuriore marginata differt. E. jubatum ab absentia odoris farinae, sporis minoribus et lamellis non obscuriore marginatis differt.

Cap 15–50 mm., convex soon expanded sometimes becoming depressed, often umbonate (umbo generally small and obtuse), sepia-horn with darker sepia or vandyke centre, slightly paler when dry, at first *entirely scattered adpressed minutely silky-fibrillose, almost tomentose at centre*, becoming smoother with age or in wet weather, with strong silky-hoary sheen when dry. *Gills* adnate ± emarginate, pale grey or grey-horn then dirty pinkish or pinkish brown, subdistant, L 22–30 l 1–3, *edge darker brownish* flocculose.

Stem 25–54/2–6 mm., equal or slightly thickened at base or apex, base sometimes clavate thickened, concolorous or paler above, *whitish or pale cream at base*, or up to 1/3 of its length when growing in *Sphagnum*, silky-fibrillose striate or sometimes slightly horny-streaky, stuffed then hollow. *Flesh* dark sepia-horn in cap, white or whitish in centre of stem, paler or darker horn in stem cortex. *Smell mealy*, strong when cut. *Taste* mealy. *Spores* ellipsoid-oblong angular, 9–12(13)/6½–8 μ (Fig. 269). *Basidia* 4-spored, 38–46/10–12 μ. *Marginal cystidia fusiform-clavate to lageniform* often with longer or shorter neck and *sometimes with capitate apex*, often with brownish vacuole, 36–72/10–25 μ, apex 3–5 μ or when capitate 6–8(10) μ (Fig. 411). Hyphae of cap cuticle 6–16 μ diam. with brownish vacuolar pigment or 2–10 μ diam. strongly encrusted-pigmented.

In *Sphagnum* or on peaty soil: Tomich, 18 Sept. 1958 (in *Sphagnum*, type in Herb. Kew), 24 Sept. 1958 (amongst heather); West Sandwick, Yell, 3 Sept. 1952 (legit R. W. G. Dennis, on peaty soil); Holt Lowes, 5 Oct. 1958 (in *Sphagnum*, legit J. T. Palmer). Nearest to *E. helodes* (also with mealy smell) but differs in dark gill edge and minutely silky-fibrillose, not virgate- or innately-fibrillose cap. *E. jubatum* is similarly coloured but does not smell or taste mealy, has smaller spores and the gill edge is not darker.

ENTOLOMA HELODES (Fr.) Kummer

This name was removed from the British list by Pearson & Dennis (1948) on the grounds that it was 'not known'. I have reinstated it since I found it not uncommonly in the Scottish Highlands in *Sphagnum* or on peaty ground; it probably occurs elsewhere in Britain on suitable ground, as I have found one specimen at Oxshott, Surrey. It is one of five species all with rather conspicuous ± fusiform or lageniform marginal cystidia, of which some at least are capitate, measuring 30–72/8–25 μ with apex 3–11 μ (see Fig. 411). Of these five, two, *E. helodes* and *E. fuscomarginatum*, smell and taste mealy; the others have no distinctive taste or smell. *E. helodes* is coloured like *E. fuscomarginatum* but lacks the dark gill edge and has an innately- or virgate-fibrillose cap rather than silky-fibrillose. Future field work may show that these two species are not worth separating, but it is perhaps better to distinguish them for the moment since they look distinct in the field. (In tracing the history of a species it is easy to combine the records of its synonyms but the reverse process is much more difficult!)

Key to 'helodes' *group of* Entoloma

1. Gills with conspicuous dark brown edge; smell and taste mealy; cap 15–50 mm., minutely silky-fibrillose when moist, sometimes almost tomentose at centre, silky-hoary when dry; spores ellipsoid-oblong angular, 9–12(13)/6½–8 μ (Fig. 269); in *Sphagnum* or on peaty ground *E. fuscomarginatum*
1. Gill edge not darker or very rarely slightly so when old 2
  2. Smell (at least when cut) and taste mealy; cap 25–75 mm., finely tomentose at centre, remainder innately-fibrillose; spores ellipsoid-oblong, 9–12/7–8½ μ; in *Sphagnum* or on peaty ground *E. helodes*
  2. Smell and taste none or faint fungussy 3
3. Smaller (cap 12–40 mm.; stem 3–4 mm. diam.); cap radially fibrillose, often becoming rimose or furrowed at margin when dry or old; spores ellipsoid-

oblong angular, 9–11(12)/6–7(8) μ; basidia 2- or 4-spored on same gill; in grass or in woods *Nolanea inutilis*

3. Often larger (cap 20–90 mm.; stem 3–10 mm. diam.); cap minutely tomentose-scaly or fibrillose-tomentose except sometimes at margin **4**
    4. Stem (and often cap margin also) when young with violaceous or purplish brown tinge persisting for a long time on middle part; spores 10–14/6–8 μ, ellipsoid-oblong angular; more robust (cap 30–90 mm., stem 4–10 mm. diam.); usually in fields *E. porphyrophaeum*
    4. Stem and cap entirely sepia or sepia-grey without violaceous or purplish tinge at any stage; spores 8–10(11)/5½–6½(7) μ, ellipsoid-oblong wavy-angular; less robust (cap 20–52 mm., stem 3–7 mm. diam.); in grass or moss, often in woods also in fields *E. jubatum*

(There has been confusion in this group, for synonymy see 'List'.)

Entoloma majaloides sp.nov. (Figs. 20–22, 270)

Pileus 36–85 mm., e convexo vel conico-convexo expansus, obtuse vel leviter acute umbonatus, interdum circa umbonem depressus vel ad marginem lobatus, fusco-mellinus vel luteolofuscus, interdum ad discum umbrino-tinctus vel ad marginem clariore luteolotinctus, siccitate a disco ad marginem sordide lutescens vel luteolobrunnescens, jove pluvio striatus, jove sicco obscure lineatus et totus minute ad umbonem distinctissime albo-sericeo fibrillosus. Lamellae adnatae ± emarginatae, pallide griseae vel colore cornus tinctae, interdum sordide luteolo-tinctae, dein pallide brunneo-griseae vel griseo-incarnatae postremo brunneo-incarnatae, subconfertae L 36–60 l 3–7(11), ad aciem vulgo inaequales. Stipes 35–105/6–17 mm. (infra 8–25 mm. diam.), vulgo robustus, conico-attenuatus vel clavato-bulbosus, rariore fere aequalis, interdum ad basim leviter acute radicatus, colore cornus tinctus vel pallide sordide fuscus, sericeo-fibrillosus vel leviter ruguloso-striatus, primo durus dein fragilis, farctus senectute interdum cavus. Caro alba vel albida, sub cuticulis colore cornus tincta. Odor nullus. Sapor insipidus, plane manso ingratus. Sporae late ellipsoideae angulatae, 8–10½/6½–8 μ (Fig. 270). Acies lamellarum fertilis. Hyphae cuticulae pilei filamentosae, ramosae, fibulatae, sine pigmento, 4–14 μ latae.

In betuletis et in silvis coniferis. Loch Craiglush, Dunkeld, Perthshire, 4 Sept. 1954; Loch-an-Eilean, Rothiemurchus, Inverness-shire, 8 Sept. 1957 (sub Pino sylvestre et Junipero, typus in Herb. Kew.); Lower Tullochgrue, Rothiemurchus, Inverness-shire, 7 et 8 Sept. 1958 (in betuletis). Coloribus pilei luteolis, habitu robusto, absentia odore, sporis late ellipsoideo-angulatis insignis.

Cap 36–85 mm., convex or conico-convex then expanded, obtusely or slightly acutely umbonate, sometimes slightly depressed round umbo or with wavy-lobed margin, *sepia-honey or yellowish sepia*, sometimes tinged umber at centre or *brighter yellowish at margin*, *drying dirty yellowish* or buff from centre, striate when moist, drying darker streaky and entirely minutely white silky-fibrillose, especially noticeable on umbo. *Gills* adnate ± emarginate, pale grey or tinged horn-colour sometimes with faint dirty yellowish tinge then pale brownish grey or greyish pink finally brownish pink, subcrowded, L 36–60 l 3–7(11), edge often uneven. *Stem* 35–105/6–17 mm. (8–25 mm. below), *often robust*, conico-attenuated or clavate-bulbous, more rarely ± equal, sometimes with slightly pointed rooting base, pale horn or pale dirty brownish, silky-fibrillose striate or slightly rugulose-striate, hard and firm at first later fragile, stuffed, sometimes hollow when old. *Flesh* white or whitish in centre of cap and stem, pale dirty whitish or pale horn under cap cuticle or in stem cortex. *Smell* none (one specimen when very old was slightly nitrous!). *Taste insipid followed by nasty after-taste* when well chewed (rancid-garlic as in *E. seri-*

catum, *E. nidorosum*, *Leptonia polita* and *Eccilia paludicola*). *Spores* broadly ellipsoid-angular, 8–10½/6½–8 μ (Fig. 270). *Gill edge* fertile. Hyphae of cap cuticle 4–14 μ diam., filamentous, branched, clamped, not pigmented.

In birch or coniferous woods, Loch Craiglush, Dunkeld, 4 Sept. 1954 (under planted conifers); Loch-an-Eilean, Rothiemurchus, 8 Sept. 1957 (under pine and juniper, type in Herb. Kew); Lower Tullochgrue, Rothiemurchus, 7 and 8 Sept. 1958 (under birch). Readily distinguished by yellowish cap tints, robust habit, lack of smell and broadly ellipsoid angular spores. Differs from *E. rhodopolium* chiefly in yellowish colours, also in gills not white at first and more coloured stem. The nasty aftertaste suggests affinity with *E. sericatum*, etc. I have not yet been able to confirm a nasty after-taste for *E. rhodopolium* (taken s. J. Lange). The yellowish colours are very striking and constant in fresh and even fairly old fruit bodies. I have chosen the epithet *majaloides*, because Fries described colours approaching these for *Agaricus majalis* but the other characters of the latter are not applicable.

ENTOLOMA TURBIDUM (Fr.) Quél. (= *Agaricus* (Nolanea) *turbidus*, Fries, *Syst. Mycol.* 1 (1821), 205) (Fig. 268)

The essential features for distinguishing this species as originally described by Fries are cap 'umbonato, fusco, margine striato rimoso', grey gills, silvery-grey stem and later (1838) lack of smell. I think it best to keep the epithet *turbidum* for Ricken's interpretation, which agrees well with that of Fries and is further characterized by having rather small spores with rounded angles. This I believe also to be *E. cordae* s. J. Lange. This fungus is not uncommon in Britain chiefly in woods but also sometimes in fields. In *Monographia* Fries stresses 'Pileus glaber, fusco-lividus margine striato', 'lamellae griseae' and 'stipes deorsum clavato-inflatus' for the typical form, which he says is inodorous. All these characters are applicable to Ricken's interpretation, which I have described below from British material. Fries's 'formae pinetorum' are not relevant to the identity of *E. turbidum*. *E. turbidum* s. Konrad & Maublanc and probably also Bresadola is I think a different fungus with the cap brighter, almost chestnut coloured when moist, and rather larger spores with more marked angles (8½–10½/6½–8 μ), which I believe I have collected in Scotland under birch and pine, but in the absence of personal notes and dried material I prefer to await collection of further material before dealing with it. *E. turbidum* s. Pearson (1949) I suspect to be a mixture, a spore print so named by him had the larger, markedly angled type of spore. *E. turbidum* s. J. Lange is doubtful and not known to me.

Cap 25–65 mm., convex then expanded, frequently obtusely umbonate, *dark sepia-grey or livid-grey*, sometimes darker sepia-horn or almost black at centre, drying paler grey, sometimes radially darker streaky when half dry, striate at margin when moist, matt or with innate radial silky sheen when dry, margin often splitting and cracking radially. *Gills* narrowly adnate to free, often deeply emarginate and ventricose, *grey or grey-horn* then pinkish grey or pinkish grey-horn, subcrowded, L 32–44 l 1–3 (or L 60 l 0–1), sometimes veined on sides or interveined, edge often uneven.

Stem 30–95/4½–9 mm., often clavate-bulbous or attenuated upwards from thickened base (may be 10–18 mm. diam.), more rarely equal, whitish or *silvery-grey then sometimes flushed darker grey-horn from base* or at apex, apex slightly pruinose, remainder rather conspicuously silvery-silky fibrillose-striate, sometimes twisted-striate, stuffed then hollow, fragile, base often whitish tomentose. *Flesh* concolorous, drying white or pale greyish in centre of cap and stem, sometimes dark horny over gills or tinged dirty yellowish-brown in lower stem. *Smell none* or slightly fungussy. *Taste* none or with slight nasty after-taste. *Spores 6½–9(10)/5½–7* μ, subglobose or broadly ellipsoid *with rather rounded angles* (Fig. 268). *Basidia* 4-spored. *Gill edge* fertile.

Solitary, in small groups or subcaespitose, chiefly in woods also in fields. Gannochy, Glenesk, Kincardineshire, 29 Aug. 1953, in fir plantation; Langcliffe Brow, Settle, Yorks, 19 Sept. 1953, in grass; Ruislip, Middx., 15 Oct. 1955 (legit F. B. Hora); Dawlish Warren, Devon, 29 Oct. 1955, in deep heather. Fairly easy to distinguish by lack of smell, rather small spores with rounded angles and grey gills. No doubt this is one of several fungi which have been named *E. costatum* in the past simply because the gills happened to be veined, a feature found in several species of *Entoloma*.

FLOCCULINA

Key to the species

(Including some not yet British (included in brackets) which are likely to belong here.)

1. Relatively large, growing on wood; cap 24–70 mm., stem 2–6 mm. diam. **2**

1. Smaller, habitats various; cap rarely more than 20 mm., sometimes minute (1½–5 mm.), but up to 30 mm. in *F. muricata*; stem 0·1–2 mm. diam. **3**

2. Cap ochre-buff to tawny-golden, scarcely hygrophanous, with minute erect darker pointed scales; stem yellow above, concolorous or tawny-date-brown below, fibrillose-striate below ring; ring yellow-floccose, soon torn and fugacious; spores (6½)7–8(10)/4–4½(5) μ ± phaseoliform; marginal cystidia cylindric or clavate, 24–32/7–18 μ *limulata*

2. Cap brick-red or reddish buff, hygrophanous, tinged tawny when dry, densely whitish flocculose-furfuraceous (flocci easily rubbed off); stem pale rusty, fibrillose peronate below ring; ring distinct, membranous at first; spores sec Singer 7–8/4–5·8 μ, ± phaseoliform; marginal cystidia sec Singer cylindric or slightly fusiform, apex ± obtuse, rarely subcapitate, 45–70/8–8½ μ, apex 3–4 μ; (a northern species for which there is no authentic British record, but which may belong to this genus: *Pap. Mich. Acad. Sci.* **32** (1948), 143, for Singer's description)
(*Pholiota confragosa* (Fr.) Karst., 1879)

3. Cap 7–23 mm., straw-yellow with minute adpressed fibrillose tawny squamules; growing on *Phragmites* debris; spores bacilliform or phaseoliform, 5¾–6¾/2½ μ sec J. Lange; marginal cystidia cylindric-clavate, 30–35/4–5 μ sec J. Lange; stem 17–30/1–1¾ mm., pallid yellowish above, ± rusty below, with about 5 stiff radiating mycelioid hairs at base
(*Naucoria pityrodes* (Briganti) Sacc., 1887)

(Generic status not certain, but might be placed here; not yet recorded in Britain—L 124 B.)

3. Not so **4**

4. Cap 5–15 mm., rusty-tawny or tawny-bay, entirely minutely fibrillose-scaly, scales on disk ± erect, margin often fringed-lacerate, cells of scales ±

cylindric 5–18 μ diam.; stem 4–20/½–1½ mm., with similar scales on lower part; spores 10–12/7–8 μ, ellipsoid or slightly amygdaliform; marginal cystidia cylindric flexuose, 40–60/3–5 μ; growing on wood or twigs *Phaeomarasmius erinaceus*

(May be mistaken for a *Flocculina*, but is rather more tough and will revive)

4. If colour of cap is similar some cells at least of scales ± spherical; spores not more than 10 μ long except in *F. fusispora* and *Naucoria saliciphila*; habitats various **5**

5. Small or very small (cap not exceeding 10 mm.); spores ochraceous in mass, almost colourless and thin-walled sub micr. (daylight in H_2O); growing on plant debris of various sorts, less commonly on soil; cap atomate-furfuraceous or granular-scaly, cells of scales mostly globose to shortly ellipsoid (Fig. 409) **6**

5. Small (cap 5–20(30) mm.); spores ± rusty in mass, walls thicker and yellowish or brownish sub micr.; growing on soil or on wood or plant debris **15**

Paler spored species

6. Cap pure white; stem white then pale honey; cap 1½–5 mm.; stem 4–9 mm. long; spores 7–10/3½–4½ μ, amygdaliform or ventricose-fusiform; gills very distant, flesh colour then ochraceous; on oak leaves (*N. delicatuloides* Kühner) (*Bull. Soc. Nat. Oyonnax*, **10–11** (1957), Suppl., 16, Fig. 6)

6. Cap whitish then very pale ochraceous or yellowish or tinged flesh-colour to deeper yellowish, ochraceous, red-brown or yellow-brown **7**

7. Spores 4–7½/2½–4 μ, ellipsoid- or fusiform-amygdaliform; very small, cap 1½–5 mm., whitish to pale ochraceous; on soil in damp places **8**

7. Spores 7–12(14)/3½–6 μ, shapes various; small or very small fungi, cap 1½–10 mm., paler or deeper in colour; usually on leaves, beech nuts or other plant debris, less commonly on soil **9**

8. Spores 4–6/2½–4 μ, ellipsoid-amygdaliform (Fig. 272); marginal cystidia cylindric-flexuose often slightly swollen below or lageniform, 26–54/5–8 μ, apex 3–5 μ; stem pale ochraceous soon rusty-date-brown in lower part *pusillima*

8. Spores 5–7·5/2·7–4 μ, fusiform-amygdaliform (in figures of Romagnesi); marginal cystidia cylindric, slightly swollen at base or utriform, 20–25/3½–6½ μ; stem whitish then 'roussâtre', 'roux' when wet; cap 1½–3 mm.; stem 6–10/0·2–0·3 mm. (*Naucoria speireoides* Romagnesi non s. Kühner, see below, p. 236).

9. Very small, cap 1½–4 mm., whitish then very pale ochraceous or pinkish ochraceous; on dead leaves in damp places; basidia 2-spored; spores (8)9–12(14)/(2½)3–4 μ, elongate fusiform (Fig. 271); stem 3–11/0·1–0·3 mm., whitish or concolorous; marginal cystidia cylindric-flexuose to almost lageniform, 22–48/3–6 μ, apex 3–6 μ (Fig. 408) *fusispora*

9. If cap less than 5 mm., then colours darker or basidia 4-spored and spores shorter or of different shape **10**

10. Cap and stem ochraceous or buff without pinkish or reddish tints; marginal cystidia ± lageniform with long narrow neck; basidia 4-spored **11**

10. Cap and stem tinged pinkish, reddish or rusty; marginal cystidia various **12**

11. Growing on beech debris (nuts, twigs or more rarely leaves); marginal cystidia 40–60/6–8 μ, apex 2–4 μ; spores 7–10/4½–6 μ, ellipsoid-amygdaliform or amygdaliform; cap 3–10 mm. *carpophila*

11. Growing on leaves or twigs of sedges, grasses, willows or birches or in moss in damp places; marginal cystidia shorter 30–40/4½–7 μ; spores 7–9(9½)/(3½)4–5(5½) μ, navicular or limoniform papillate sec Favre; cap 3½–7 mm. (*Flocculina rhombospora* (Atk.) P. D. Orton; Favre, HM (1948), 144)

12. Marginal cystidia lageniform with long narrow neck, apex 2–3 μ **13**

12. Marginal cystidia cylindric, often flexuose and ± capitate *or* lageniform with short neck and broader apex (4–10 μ diam.) **14**

13. Cap dirty flesh colour or pallid-tan, mealy atomate or finely floccose-granular,

4–10 mm.; stem 15–40/½–1½ mm., concolorous or darker brownish at base; on debris of various trees; spores 7½–9/5–6 μ, broadly amygdaliform or limoniform; marginal cystidia 26–46/6–10 μ (< 50/12 μ sec Kühner) *carpophiloides*

13. Cap bright tawny-rusty or tinged orange, then duller, 7½–10 mm., darker red-brown granular punctate at least in central part; stem 15–20/0·7–1 mm., rusty or reddish brown, reddish bay at base; on debris of chestnut and other trees; spores 7½–8½/5–6 μ, amygdaliform; gills also bright tawny-red-brown (*N. microspila* Romagnesi) (*Bull. Soc. Nat. Oyonnax*, **10–11** (1957), Suppl., 5)

14. Cap not striate when moist, pale pinkish tan; spores 7½–10/4½–5½ μ, fusiform-amygdaliform or limoniform; marginal cystidia cylindric-capitate or lageniform with obtuse apex, 34–48/6–12 μ, apex 7–10 μ diam.; on leaves and twigs of beech, etc. *subincarnata*

14. Cap pinkish-buff with darker striae when moist, whitish or pale when dry, margin crenulate; spores 10–12/6–7 μ, amygdaliform or sublimoniform; marginal cystidia cylindric-flexuose sometimes subcapitate, 38–60/4½–7 μ; on willow debris (*F. saliciphila* (Favre) P. D. Orton; Favre HM (1948), 146, fig. 63)

Darker spored species

15. Spores ± phaseoliform (sometimes ellipsoid in some views); cap ochraceous or tinged tawny to dark rusty (never deep red-brown or cow-red) **16**

15. Spores ellipsoid- or ovoid-amygdaliform; cap ochre-buff, date-brown or sepia to deep red-brown or cow-red **18**

16. Cap and stem granular-floccose scaly or pointed warty-scaly (stem loosely floccose-fibrillose in *ferruginea*); growing on wood or plant debris; spores 6½–8½/4–4½ μ **17**

16. Cap papillate-granular scaly, stem finely fibrillose-striate but without scales as on cap; on soil under alders or mixed deciduous trees; spores phaseoliform or almost cylindric, 7·5–9·2(10·8)/3·5–4·6 μ; cap 10–12 mm., dark rusty; stem 20–30/1–1½ mm.; marginal cystidia clavate-vesiculose 17–33/8–17 μ (*N. wieslandri* (Fr.) Sacc. s. Singer)

17. Stem 15–50/1½–4 mm., ochraceous or tinged tawny with pointed warty floccose scales except at apex (cells of scales globose or ellipsoid as on cap); cap 6–30 mm., ochraceous or tinged tawny, with ± concolorous pointed ± conical warts, margin with appendiculate veil; marginal cystidia cylindric-capitate with long stalk, 50–72/5–6 μ, apex 9–14 μ *muricata*

17. More slender; stem 7–30/0·5–1 mm., concolorous but yellowish at apex, with often rather pointed floccose scales (cells not same as on cap, mostly cylindric in chains, but end cell often rather fusiform-pointed); cap 5–15 mm., yellowish or rusty-honey or tinged tawny, with darker or concolorous floccose-granular scales (cells globose or ovoid), margin fringed-dentate at first; marginal cystidia similar, 20–64/4–5 μ, apex 5–12(14) μ; not uncommon on deciduous twigs *erinaceella*

18. Cap ochre-buff, date-brown or sepia; growing on bare soil (especially stiff clayey soils); cap 4–15 mm., granular-floccose papillate-scaly; stem 10–25/½–1½ mm., concolorous but paler at apex, fibrillose-tomentose and floccose-scaly; spores 8–10/4½–5½ μ, ellipsoid-amygdaliform; marginal cystidia cylindric-flexuose, sometimes slightly swollen below, less commonly narrowly lageniform, 40–60/6–8(9) μ, apex 2–4 μ; quite common *granulosa*

18. Cap deep red-brown or cow-red, chestnut or rusty-brown; growing on soil, in moss or on wood or plant debris **19**

19. Growing on wood or plant debris (fern stems sec Fries); spores 8–9½(10)/5–5½ μ, ovoid-amygdaliform; cap *ca.* 10 mm., floccose pointed warty-scaly; stem *ca.* 20/0·8 mm., concolorous with similar scales except at paler apex; marginal cystidia clavate to vesiculose-mucronate 25–35/6½–14 μ sec Singer; uncommon *siparia* s. Fries, Singer, Cooke (see Part II, p. 215)

19. Growing on soil or in moss; spores 6–8/4–5 μ, ellipsoid-amygdaliform or ellipsoid; cap 5–16 mm., deep red-brown or cow-red, granular-scaly at centre, margin with remains of veil; stem 7–20/½–3½ mm., concolorous with rather loose floccose-fibrillose veil; marginal cystidia cylindric-flexuose sometimes swollen below, often subcapitate, less commonly lageniform, 30–52/4–10(12) μ, apex 4–6(8) μ; quite common *ferruginea*

Flocculina fusispora sp.nov. (Figs. 216–217, 271, 408, 409)

Pileus 1½–4 mm., e convexo mox ± expansus, interdum leviter umbonatus, albidus dein pallidissime ochraceus vel incarnato-ochraceus vel pallide mellino tinctus, e velo laxe fibrilloso-floccoso squamulis minutis furfuraceo-granulosis totus obtectus, jove pluvio ad marginem pellucido-striatus interdum sulcatus crenatusque, ad marginem e velo appendiculato juventute eleganter fimbriatus. Lamellae anguste adnatae, aliquantum angustae sed leviter ventricosae, ex albido pallide ochraceae vel incarnato-ochraceae, distantes, L 12–16 l 0–3, ad aciem sub lente minutissime flocculoso-denticulatae. Stipes 3–11/0·1–0·3 mm., filiformis, interdum ad basim leviter incrassatus, vulgo flexuosus, albidus vel pallide-ochraceus vel -mellinus, interdum fere hyalinus, sub lente totus minute pubescens interdum residuis sericeo-floccosis veli. Sporae elongato-fusiformes apiculo obliquo, sub micr. pallidissimae (8)9–12(14)/(2½)3–4 μ (Fig. 271). Basidia 2-sporigera, 24–28/5–6 μ. Cystidia aciei lamellarum cylindrico-flexuosa interdum ad apicem vel magis frequenter ad basim incrassata, rariore fere lageniformia 22–48/3–6(10) μ ad apicem 3–6 μ lata (Fig. 408). Cellulae veli ad pileum globosae, ellipsoideae, vesiculosae vel subcylindricae, rariore fere lageniformes, 10–56/10–28 μ, tunicis leviter crassis et minute punctatis (Fig. 409). Pili ad stipitem cystidiis aciei lamellarum similes 22–50/3–7 μ, interdum pili longiores (< 200 μ) adsunt.

Ad folias putridas in locis humidis. Tuck's Ride, Surlingham, Norfolk (ad foliam Querci), 11 Oct. 1957; Kingthorpe, Yorks, (ad folias Alni et Coryli), 14 Sept. 1959 (legit C. G. La Touche, typus in Herb. Kew.). A basidiis bisporigeris sporis elongato-fusiformibus statura minutissima facile distinguitur.

Cap 1½–4 mm., convex soon ± expanded sometimes slightly umbonate, *whitish then very pale ochraceous or pinkish ochraceous* or tinged flesh- or honey-colour, entirely minutely furfuraceous-granular scaly from loosely fibrillose-floccose veil, pellucid-striate at margin when moist or sometimes sulcate and crenate, *margin delicately fringed by appendiculate veil when fresh. Gills* narrowly adnate, rather narrow but slightly ventricose, whitish then pale ochraceous or pinkish-ochraceous, distant, L 12–16 l 0–3, edge very minutely flocculose-denticulate under lens. *Stem* 3–11/0·1–0·3 mm., filiform, often flexuose, sometimes slightly swollen at base, whitish or pale ochraceous or pale honey, sometimes rather hyaline, *entirely minutely pubescent under lens*, sometimes with silky floccose veil remnants. *Spores elongate-fusiform* with oblique apiculus, almost colourless sub micr., *(8)9–12(14)/(2½)3–4 μ* (Fig. 271). *Basidia 2-spored*, 24–28/5–6 μ. *Marginal cystidia* cylindric-flexuose sometimes slightly swollen at apex or more frequently at base, a few ± lageniform, 22–48/3–6(10) μ, apex 3–6 μ (Fig. 408). Cells of veil on cap globose, ellipsoid, vesiculose or subcylindric, a few almost lageniform, walls slightly thickened and minutely punctate, 10–56/10–28 μ (Fig. 409). Hairs on stem similar to marginal cystidia, 22–50/3–7 μ, hairs up to 200 μ long may also be present.

On decaying leaves in damp places, Tuck's Ride, Surlingham (on oak leaf), 11 Oct. 1957; Kingthorpe (legit C. G. La Touche, on alder and hazel), 14 Sept. 1959 (type in Herb. Kew). Readily distinguished from the other small pale species of *Flocculina* by 2-spored basidia and relatively long elongate fusiform spores. I thought at first this was a 2-spored form of *F. rhombospora*, owing to macroscopic resemblances, but since these are not quite exact, and in view of the microscopic differences and the fact that the basidia were consistently 2-spored in both my collections, I prefer to describe it as a new species.

Flocculina pusillima sp.nov. (Fig. 272)

Pileus 1½–4 mm., e convexo vel conico-convexo expanso-convexus, raro levissime umbilicatus, pallide cremeo-ochraceus vel ochraceo-albidus, vulgo ad discum obscuriore coloratus, jove pluvio striatus, jove sicco plicato-sulcatus et opacus, fibrillis paucis sparsis obtectus. Lamellae adnatae vel dente decurrentes, vulgo planae, pallide ochraceo-albidae, distantes, L 7–9 l 1(3), ad aciem sub lente flocculoso-denticulato. Stipes 6–12/0·1–0·3 mm., filiformis, pallide ochraceo-albidus mox infra ferruginascens, interdum supra fere hyalinus, primo infra sparse albido-fibrilloso floccosus dein glabrescens. Sporae ellipsoideo-amygdaliformes, 4–6/2½–4 μ (Fig. 272), sub micr. fere hyalinae. Cystidia aciei lamellarum cylindrico-flexuosa, leviter lageniformia vel infra incrassata, 26–54/5–8 μ ad apicem 3–5 μ. Hyphae cuticulae pilei laxe intextae, cellulae aliquantum breves, cylindrico-clavatae, ellipsoideae vel curvatae, ca. 20–30/4–16(20) μ.

In solo humido in silvis nemorosis, Clapham Woods, Clapham, Yorks, 27 Aug. 1958 (type in Herb. Kew.). Fungus minutissimus, sporis parvis pallidis, colore pilei lamellarumque cremeo-ochraceo vel ochraceo-albido, stipite infra ferruginascente insignis. Naucoria speireoides Romagnesi sensu Kühner non Romagnesi idem censeo.

Cap 1½–4 mm. (5½ sec Kühner), convex or conico-convex, then expanded-convex sometimes very slightly umbilicate, *pale creamy-ochraceous or ochraceous-whitish* often slightly darker at centre, striate when moist, slightly plicate-sulcate when dry and matt, with a few scattered whitish fibrils. *Gills* adnate or decurrent with a tooth, often plane, pale ochraceous-whitish, distant, L 7–9 l 1(3), edge flocculose-denticulate under lens. *Stem* 6–12/0·1–0·3 mm., filiform, pale ochraceous-whitish *soon discoloured rusty-date-brown in lower part*, sometimes almost hyaline above, with a few scattered whitish fibrillose flocci on lower part at first then ± smooth. *Spores ellipsoid-amygdaliform, 4–6/2½–4 μ* (Fig. 272), very pale sub micr. Marginal cystidia cylindric-flexuose to slightly lageniform or swollen at base, 26–54/5–8 μ, apex 3–5 μ. Hyphae of cap cuticle loosely interwoven, cells cylindric-clavate, ellipsoid or sausage-shaped, rather short, *ca.* 20–30/4–16(20) μ.

On wet soil in a shady wood. Clapham Woods, Clapham, 27 Aug. 1958 (type in Herb. Kew). A minute fungus recognized by small ellipsoid-amygdaliform pale spores and pale cap and gills but stem soon rusty date-brown below. This is *Naucoria speireoides* Romagnesi s. Kühner (*Bull. Soc. Nat. Oyonnax*, **10–11** (1957), Suppl., 17), but not s. Romagnesi (l.c., p. 68, Fig. 34) which differs in more fusiform-amygdaliform longer spores (judging by drawings), paler stem and perhaps shorter marginal cystidia, so that I prefer to describe my fungus as a new species pending more information on *N. speireoides*.

Galerina ampullaceocystis sp.nov. (Figs. 23–25, 273, 412)

Pileus 6–14 mm., e convexo vel conico-convexo expansus, aut papillatus aut obtuse umbonatus, fulvo-mellinus ad marginem pallidiore ochraceus vel leviter luteolus ad discum interdum obscure umbrinus, siccitate pallide ochraceus vel ochraceo-mellinus interdum ad discum persistentiore obscuriore coloratus, jove pluvio striatus, jove sicco opacus vel leviter sericeo-nitidus, juventute ad marginem residuis veli obtectus. Lamellae adnatae vel adnato-decurrentes, e pallide cremeo-ochraceo vel ochraceo-mellino pallide vel obscuriore ferrugineo-mellinae, subconfertae, L 16–20 l 3, juventute ad aciem minute albo-flocculosae. Stipes 18–40/1–2 mm., aequalis vel ad basim leviter incrassatus, supra pallide ochraceus vel ochraceo-mellinus infra obscuriore ferrugineo-mellinus vel colore sucini tinctus, ad apicem minute albopruinosus, e velo albo vel albido annuloso-zonatus vel annulo angusto membranaceo et infra maculis dispersis decoratus. Caro concolorata. Odor et sapor farinacei. Sporae ellipsoideo-amygdaliformes, 9–11½/5–6 μ sub. immers. laeves (Fig. 273). Basidia 2-sporigera, 24–30/7–9 μ. Cystidia aciei lamellarum infra vesiculoso-incrassata cervice anguste breve vel longa rariore ad apicem subcapitata, (20)24–35/8–14 μ, cervice 8–16(20)/1–2 μ ad apicem 1–2(3) μ lata (Fig. 412). Cystidia faciei lamellarum nulla. Hyphae cuticula pilei filamentosae interdum incrustato-pigmentatae, rariore ramosae, cellulae ± cylindricae vulgo minute fibulatae, 4–14 μ latae. Hyphae veli hyalinae 3–6 μ latae fibulatae.

Ad lignum putridissimum (probabiliter coniferi), Tomich, Inverness-shire, 15 July 1958 (typus in Herb. Kew.). Characteribus veli, sporarum et cystidiorum insignis.

Cap 9–14 mm., convex or conico-convex then expanded, either papillate or obtusely umbonate, *tawny-honey with paler ochraceous or slightly yellowish margin and darker sometimes vandyke centre*, drying pale ochraceous or ochraceous-honey from centre, centre sometimes remaining darker, striate when moist, matt or with slight silky sheen when dry, margin sometimes fringed with remnants of veil when young and fresh. *Gills* adnate or adnato-decurrent, *pale creamy-ochre or ochraceous-honey* then pale to deeper rusty-honey, subcrowded, L 16–20 l 3, edge minutely white flocculose under lens when fresh. *Stem* 18–40/1–2 mm., equal or slightly swollen at base, pale ochraceous or ochraceous-honey above, darker rusty-honey or pale amber below, apex minutely white pruinose, *white or whitish veil forming ring-zone or narrow membranaceous ring and scattered patches* below this. *Flesh* concolorous. *Smell* and *taste* mealy. *Spores* ellipsoid amygdaliform, *9–11½/5–6 μ smooth sub immers.* (Fig. 273). *Basidia 2-spored*, 24–30/7–9 μ. *Marginal cystidia vesiculose below with shorter or longer narrow neck* (ampul-like), only occasionally capitate at apex, (20)24–35/8–14 μ, neck 8–16(20)/1–2 μ, apex 1–2(3) μ (Fig. 412). *Facial cystidia* none. Hyphae of cap cuticle filamentous, some encrusted-pigmented, occasionally branched, cells often ± cylindric often with small clamp, 4–14 μ diam. Hyphae of veil, hyaline, clamped, 3–6 μ diam.

On very rotten wood (probably coniferous); Tomich, Inverness-shire, 15 July 1958 (type in Herb. Kew). I thought at first this might be *G. pseudocamerina* but on account of the well-marked veil, smaller spores and rather differently shaped cystidia I prefer to describe this as a new species. Differs from other veiled species of *Galerina* in its bright colours, spore and cystidial characters and possibly habitat. The shape of the cystidia is particularly striking.

Galerina calyptrata sp.nov. (Figs. 26–28, 274, 410)

Pileus 3–9 mm., e conico-convexo expanso-convexus, papillatus vel umbone parvo obtuso, clare fulvo-ochraceus vel mellino-luteus, ad marginem vulgo pallidiore ochraceo-tinctus, ad discum jove pluvio fere aurantius, jove sicco luteo-ochraceus vulgo ad discum fulvo-tinctus, jove pluvio striatus, ad marginem interdum fere crenatus primo residuis fugacibus veli albi obsitus. Lamellae adnatae interdum dente decurrentes, e luteolo vel pallide mellino ochraceoluteae, postremo ferrugineo-mellinae vel praecipue ad basim ferrugineo-fulvo tinctae, subdistantes, L 10–12 l 1(3), ad aciem juventute pallidiore flocculosus. Stipes 15–45/0·5–1 mm., aequalis vel ad basim incrassatus vel bulbillosus, flexuosus, pallide ochraceo-luteus dein fulvo-mellinus vel colore pilei tinctus, fere laevis sed ad apicem sparse pruinosus, juventute solum velo albosericeo fugace obtectus, farctus dein cavus. Caro tenuis, concolorata. Odor nullus. Sapor farinaceus. Sporae amygdaliformes, vulgo a perisporio calyptratae, 9–12(14)/5–7($7\frac{1}{2}$) μ, laeves vel levissime punctatae (Fig. 274). Basidia 4-sporigera, 30–34/9–10 μ. Cystidia aciei lamellarum leviter lageniformia vulgo capitata, capitulo formarum diversarum, cervice vulgo flexuosa, 30–60/5–10 μ ad apicem 4–9(10) μ lata (Fig. 410). Cystidia faciei lamellarum non vidi.

Inter muscos. Plym Valley, Bickleigh, Devon, 29 Aug. 1956 (typus in Herb. Kew.); Loch-an-Eilean, Rothiemurchus, Inverness-shire, 26 Aug. 1955 (inter Sphagnos). Sporis calyptratis, colore pilei fulvotincto, stipite primo velato insignis. A G. calyptrospora Kühner coloribus clarioribus, pileo vulgo conico et stipite primo velato differt.

Cap 3–9 mm., conico-convex then *expanded-conical*, papillate or with small obtuse umbo, *bright tawny-ochre or honey-yellow*, margin often paler ochraceous, centre sometimes almost orange when moist, drying yellowish ochraceous sometimes with tawny tinge at centre, striate when moist, margin sometimes almost crenate and at first with remnants of white veil which soon disappear. *Gills* adnate, sometimes with tooth, yellowish or pale honey then ochraceous-yellowish, finally rusty-honey or tinged rusty-tawny especially near flesh of cap, subdistant, L 10–12 l 1(3), edge at first paler flocculose. *Stem* 15–45/0·5–1 mm., equal or with slightly thickened base or bulbillose, flexuose, pale ochraceous-yellowish then pale tawny-honey or tinged colour of cap from base up, apex sparsely pruinose otherwise almost smooth, *when young and fresh with white silky veil remnants* which soon disappear, stuffed then hollow. *Flesh* thin, concolorous. *Smell* none. *Taste* mealy. *Spores* amygdaliform often *with hood-like remains of perispore*, 9–12(14)/5–7($7\frac{1}{2}$) μ, smooth or very minutely punctate sub immers. (Fig. 274). *Basidia* 4-spored, 30–34/9–10 μ. *Marginal cystidia* slightly lageniform often capitate, head variously shaped, neck often flexuose, 30–60/5–10 μ, apex 4–9(10) μ (Fig. 410). *Facial cystidia* apparently absent.

In mosses. Plym Valley, Bickleigh, 29 Aug. 1956 (type in Herb. Kew); Loch-an-Eilean, Rothiemurchus, 26 Aug. 1955 (in *Sphagnum*); Cadover Wood, Shaugh, Devon, 27 Aug. 1956; Ingleton Wood, Ingleton, Yorks, 23 Sept. 1957.

I thought at first that since this has calyptrate spores it must be *G. calyptrospora*; but there were so many differences that I later suspected it must be different. The publication of several species of *Galerina* with calyptrate spores from North America by A. H. Smith finally convinced me that this fungus has not previously been described. It is distinguishable by its small size, habitat, bright colours and fugacious veil. It differs from *G. calyptrospora* (which I take to be a synonym of *G. hypnorum*) in its bright colours and usually more conical cap, possibly also mealy taste. I hope to publish a key to the genus *Galerina* in Britain shortly, which will perhaps help in the identification of these small but rather similarly coloured fungi. This may be *G. sahleri* (Quél.) Kühn. s. Favre, collected on bare peat and described as having calyptrate spores, but it is not likely to be *Galera sahleri* s. Quél. which was originally described as growing on coniferous wood and having spores 9 μ long.

Galerina cinctula sp.nov. (Figs. 29–31, 275, 413)

Pileus 5–15 mm., e conico-convexo expansus, vulgo obtuse vel late umbonatus, fulvo-mellinus vel mellino-luteus, siccitate luteolus interdum ad discum magis luteo coloratus, jove pluvio striatus, interdum ad marginem residuis veli albi obtectus. Lamellae adnatae pallide luteolae dein luteolo-ochraceae postremo ferrugineo-ochraceae, subdistantes vel subconfertae, L 12–24 l (0)1–3(7), ad aciem albido-flocculosae. Stipes 8–25/0·5–1·25 mm., aequalis vel ad basim leviter incrassatus vel bulbillosus, supra pallide luteolus infra mellinus, fulvo-mellinus vel pallide umbrinus, ad apicem pruinosus, e velo copioso albo-sericeo infra cinctu lato saepe obtectus sed sine annulo distincto, farctus. Caro concolorata, intra stipitem luteola. Odor praecipue fracta saporque farinacei. Sporae amygdaliformes, 10–13/5–6 μ, minute punctate (Fig. 275). Basidia 2-sporigera, 24–30/7–8 μ. Cystidia aciei lamellarum capitato-lageniformia, cervice interdum flexuosa, ventre vulgo irregulariter formato, 30–50/5–11(14) μ capitula 3–8 μ lata (Fig. 413); cellulae similes ad apicem stipitis adsunt. Cystidia faciei lamellarum nulla. Hyphae cuticulae pilei filamentosae, hyalinae, ramosae, interdum fibulatae, 6–14 μ latae; hyphae veli 4–8 μ latae.

Ad ramulos Ericae, Glen Einich, Inverness-shire, 29 Aug. 1955; ad terram, Surlingham Wood, Surlingham, Norfolk, 20 Oct. 1956 (typus in Herb. Kew.); ad lignum putridissimum, Mousewood Farm Wood, Honingham, Norfolk, 10 July 1958. Basidiis bisporigeris, cystidiis capitatis, velo copioso insignis.

Cap 5–15 mm., conico-convex, soon expanded, often obtusely or broadly umbonate, *tawny-honey or honey-yellow, drying pale yellowish from centre,* sometimes remaining deeper yellow at centre, striate to centre when moist, sometimes with remnants of veil at margin. *Gills* adnate, often ventricose, pale yellow then yellow-ochraceous or yellowish rusty, finally rusty-ochre, subdistant or subcrowded, L 12–24 l (0)1–3(7), edge whitish flocculose. *Stem* 8–25/0·5–1·25 mm., equal or slightly thickened at base or bulbillose, pale yellowish above, darker honey, tawny-honey or pale date-brown below, apex pruinose, *lower ½–¾ entirely covered with copious white-silky veil* often forming a broad band but *without distinct ring*, stuffed. *Flesh* concolorous, yellowish in centre of stem. *Smell*, especially when cut, and *taste* mealy. *Spores* amygdaliform, 10–13/5–6 μ, minutely punctate sub immers. (Fig. 275). *Basidia 2-spored*, 24–30/7–8 μ. *Marginal cystidia capitate-lageniform or skittle-shaped*, neck sometimes flexuose, venter often irregularly shaped, 30–50/5–11(14) μ, capitula 3–8 μ diam. (Fig. 413); similar cells at stem apex. *Facial cystidia* none. Hyphae of cap cuticle filamentous, hyaline, branched, sometimes clamped, 6–14 μ diam.; hyphae of veil 4–8 μ diam.

On heather twig, Glen Einich, 29 Aug. 1955; on soil, Surlingham Wood, Surlingham, 20 Oct. 1956 (type in Herb. Kew); on very rotten stump, Mousewood Farm Wood, Honingham, 10 July 1958. Distinguished by copious white veil, 2-spored basidia, capitate-lageniform cystidia and small size. I have also found what I believe to be this species in moss in the open.

GALERINA EMBOLUS (Fr.) P. D. Orton (see p. 176 and Figs. 43–46, 276, 416)

Cap 4–15(20) mm., convex then expanded-plane, sometimes papillate or with small obtuse umbo at first or becoming slightly umbilicate when old, tawny-honey or date-brown, sometimes paler yellowish honey at margin, drying yellowish or yellowish ochraceous from centre, striate when moist (usually to centre), striae dark brown, matt or slightly silky-scurfy in places when dry. *Gills* adnate often broadly so and with tooth, or subdecurrent, from almost triangular to ventricose, pale ochraceous or yellowish honey then deeper ochre to tawny-honey or rusty-honey, subdistant L (12)16–20 l (0)1–3, *rather thick*, sometimes forked near margin of cap or veined on sides or interveined, edge paler flocculose at first. *Stem* 10–25/½–1½ mm., attenuated downwards, more rarely almost equal, often flexuose, occasionally compressed, date-brown or tawny-honey, *usually becoming chestnut, bay or dark reddish brown from base*, minutely whitish silky fibrillose striate, apex slightly whitish pruinose when fresh, solid, spongy-fibrous inside, often rather tough, base when growing in sand often encircled by compacted mass of mycelium and sand. *Flesh* thin, concolorous. *Smell* none. *Taste* none or faint fungussy. *Spores* ellipsoid slightly amygdaliform, *smooth* sub immers., (8)9–11(12)/4½–6(6½) μ (Fig. 276), rusty ('antique brown' Ridgeway) in mass. *Basidia* (2–)4-spored, 36–46/8–10 μ. *Marginal cystidia* from clavate or ± cylindric to lageniform, 44–86/8–11 μ, apex 5–12(17½) μ (Fig. 416). *Facial cystidia* none. Hyphae of cap cuticle filamentous, branched, sometimes clamped, hyaline or encrusted-pigmented, 7–15(22) μ diam., cells often rather short (*ca.* 30–80 μ long).

In moss and lichens or in grass, especially on sand-dunes. Braunton Burrows, Devon, 29 Oct. 1950 (legit F. R. Elliston-Wright); Berrow, Som., 3 Oct. 1952 (legit T. J. Wallace); Dawlish Warren, Devon, 15 Dec. 1958 also 14 Nov. 1953 (legit T. J. Wallace); Rock, Cornwall, 9 Nov. 1957. This fungus was recorded by Pearson as '*Tubaria embola*' but I have transferred it to *Galerina* on account of the rusty spore-print and coloured walls of spores, preferring to restrict *Tubaria* to fungi with spores with almost colourless thin walls, such as are found in *T. furfuracea*, and a correspondingly paler ochre or rusty-ochraceous spore print. Gill shape is not diagnostic in *Galerina*, which includes species with sometimes decurrent gills (e.g. *G. paludosa*), neither is smoothness or roughness of spores (e.g. *G. mycenopsis* has smooth spores). *G. embolus* may be distinguished by spores, stem dark coloured at least below, variable cystidia and perhaps habitat. The illustration by J. Lange (L 127 B) is not very good; the accompanying description indicates my interpretation of this fungus. It should be noted that the epithet *embolus*, being a noun, should not be made to agree in gender with the genus with which it is combined.

Galerina luteofulva sp.nov. (Figs. 32–34, 277, 414)

Pileus 5–15(17) mm., e conico-convexo expansus, vulgo papillatus vel umbone parvo obtuso, raro fere planus, fulvo-mellinus ad marginem magis luteus, ad discum badius vel umbrinus, ad marginem primo clare luteus, siccitate pallide ochraceus vel luteolus, jove pluvio ad discum striatus, ad marginem primo residuis veli albi obtectus. Lamellae adnatae vel adnato-decurrentes, ± ventricosae, pallide vel clare luteae dein pallide mellinae vel luteo-brunneae postremo ferrugineo-tinctae, subdistantes, L 10–16 l 3(7), ad aciem pallide vulgo conspicue flocculosae. Stipes 12–30/1–1½ mm., ± aequalis vulgo flexuosus vel incurvatus, pallide luteus vel mellinus vel colore pilei tinctus, ad apicem luteolo-pruinosus, infra primo e velo albido fugace maculis sparsis obtectus, leviter cavus. Caro concolorata. Odor nullus. Sporae ellipsoideo-amygdaliformes, 9–12½/5½–6½ μ, punctatae vel fere laeves (Fig. 277). Basidia 4-sporigera. Cystidia aciei lamellarum ±

lageniformia cervice longa interdum flexuosa, ad apicem interdum capitata, 40–70/6–10(12) μ, ad apicem 3–7 μ diam. (Fig. 414); cellulae similes ad apicem stipitis adsunt. Cystidia faciei nulla. Hyphae cuticula pilei filamentosae, incrustato-pigmentatae, 4–8 μ latae.

Ad terram turfosam, Newby Head, Yorks, 16 Sept. 1953 (typus in Herb. Kew.); ad terram turfosam incensam, Mortimer, Berks, 26 Nov. 1954. Margine pilei et lamellis primo luteis, juventute velo albido, cystidiis et probabiliter habitatione insignis. A G. sahleri sensu Favre absentia sporarum calyptratarum, lamellis primo luteis, cystidiis diversis differt.

Cap 5–15(17) mm., conico-convex then expanded, papillate or with small obtuse umbo, rarely almost plane, *tawny-honey with darker bay-brown or vandyke disk and yellower margin, margin bright yellow at first*, drying pale ochraceous or yellowish, striate to umbo when moist, margin with remnants of white veil when young. *Gills* adnate or adnato-decurrent, ± ventricose, *pale to deep yellow* then pale honey or yellowish buff, finally tinged rusty, subdistant, L 10–16 l 3(7), edge paler flocculose, often conspicuously so. *Stem* 12–30/1–1½ mm., ± equal, often flexuose or incurved, pale yellowish or pale honey or cap colour, apex yellowish pruinose, *white veil forming fugacious scattered patches* on lower stem at first, slightly hollow. *Flesh* concolorous. *Smell* none. *Spores* ellipsoid-amygdaliform, 9–12½/5½–6½ μ, punctate to almost smooth (Fig. 277). *Basidia* 4-spored. *Marginal cystidia ± lageniform with long, sometimes flexuose neck and apex, sometimes capitate*, 40–70/6–10(12) μ, apex 3–7 μ (Fig. 414); similar perhaps less commonly capitate cells at stem apex. *Facial cystidia* none. Hyphae of cap cuticle filamentous, encrusted-pigmented, 4–8 μ diam.

On bare peat, Newby Head, 16 Sept. 1953 (type in Herb. Kew); on burnt peaty soil, Mortimer, 26 Oct. 1954. Distinguished by gills and cap margin being bright yellow at first, shape of marginal cystidia, white veil when young and probably habitat. Differs from *G. sahleri* s. Favre in absence of calyptrate spores, gills yellow at first and lageniform cystidia.

GALERINA PRATICOLA (F. H. Møller) P. D. Orton (see p. 176)

Up to a few years ago I had for a long time been puzzled by a rather common species of *Galerina* looking rather similar to *G. unicolor* (= *G. marginata*) but the spores had a small but distinct germ pore. I found it on mossy soil in woods or in mossy grass, especially in sand-dune areas. It seemed to differ from *G. unicolor* macroscopically only in having a slightly greasy-viscid cap when moist (rather like *G. sideroides*) and the margin of the cap perhaps a brighter yellow. Apart from the difference in spores it was also similar microscopically and had numerous rather long facial cystidia (lageniform with long neck). I called this *Pholiota mycenoides* s. Rea at first, but this was obviously not *G. mycenoides* s. Kühner, which I eventually collected and which seemed correct for the epithet *mycenoides*. Pearson was equally puzzled by my finds and eventually named one of my collections and also one from Ireland *Pholiota pumila* var. *subferruginea* Møller & J. Lange. I have confirmed the presence of a germ pore on spores of the Irish material and think this a correct determination but the epithet *praticola* has priority at specific level. When F. H. Møller's *Fungi of the Faeroes* was published in 1955 with *Pholiota praticola* described as a new species, I immediately recognized my agaric. I have discussed in the introduction, p. 166, the limits of *Galerina* with reference to the inclusion of species having a germ pore in the spore. The spores may appear smooth until examined sub immers., but the germ pore is often quite easily seen at low magnification (Fig. 278). This description is from British material.

Cap 10–30 mm., convex then expanded-convex, more rarely slightly obtusely umbonate, *tawny-rusty or tawny-honey with bright yellow margin when fresh then duller coloured*, drying yellowish ochraceous or with tawny-ochre tinge, striate at edge and *greasy-viscid* when moist, matt and opaque when dry. *Gills* broadly adnate with tooth or subdecurrent, often ± plane, pale yellowish-buff then rusty-honey or rusty-buff, not crowded, L *ca.* 18–20 l 3–7, edge paler and flocculose. *Stem* 20–60/1–3 mm., equal, sometimes flexuose, pale ochraceous or yellowish buff, soon bay or dark rusty in lower part, *white silky-fibrillose-striate below ring*, apex pruinose; *ring* apical, whitish then dirty brownish or coloured rusty by the spores, *large and spreading at first but thin and membranaceous*, *then collapsing* on stem. *Flesh* concolorous, dark in lower part of stem. *Smell* and *taste* mealy. *Spores* amygdaliform, 9–11/5½–7 μ with small but distinct germ pore (Fig. 278), punctate-rough with low warts sub immers. *Basidia* 4-spored. *Marginal cystidia* lageniform with long neck, which is sometimes swollen below or at apex, *ca.* 50–80/7–12 μ, apex 3–5 μ. *Facial cystidia* numerous, similar (Fig. 417).

On mossy soil in woods or in mossy grass (especially in sand-dune areas), also seen on a mossy log. Park Wood, Nork, Banstead, Surrey, 15 Oct. 1950 and 31 Oct. 1951; Norbury Park, Mickleham, Surrey, 30 Nov. 1951 (on mossy log); Dawlish Warren, Devon, 2 Oct. 1955; Freshfield, Lancs, 13 Nov. 1958; also N. Bull Island, Dublin, Ireland, 31 Oct. 1950 (legit F. C. Hassell). Differs from *G. unicolor* in spores, greasy-viscid moist cap and non-lignicolous habitat. *G. pseudopumila* (= *Pholiota pumila*) differs in shorter spores without visible germ pore, non-striate cap and less marked ring, but grows in similar habitats.

Galerina salicicola sp.nov. (Figs. 35–38, 279, 415)

Pileus 10–25 mm., e convexo expansus, vulgo papillatus vel acute umbonatus, haud raro obtuse umbonatus, luteo-ferrugineus, fulvo-mellinus vel -ferrugineus, vulgo ad marginem magis luteus vel ad discum umbrino-tinctus, siccitate luteolus ad discum fulvotinctus vel totus luteolus, jove pluvio striatus, ad marginem juventute e velo paucis fibrillis luteolis obtectus. Lamellae adnatae vulgo dente decurrentes, luteolo-mellinae dein ferrugineo-mellinae, subdistantes, L 14–24 l 1–3, raro ad faciem venosae, ad aciem aequales vel senectute flocculosae. Stipes 15–35/1½–3(4) mm., aequalis vel ad basim leviter incrassatus, vulgo flexuosus, mellinus vel pileo concoloratus, mox sursum umbrinus vel badius, e velo albido vel luteolo fugace annuloso-zonato maculis dispersis obtectus dein luteolo-striatus, ad aciem primo luteolo-pruinosus, farctus vel leviter cavus. Caro concolorata, siccitate intus luteola. Odor et sapor farinacei. Sporae amygdaliformes, (7)7½–9(10)/(4)4½–5½ μ punctatae, interdum poro germinativo parvo (Fig. 279). Basidia 4-sporigera, 20-28/5–7 μ. Cystidia aciei lamellarum utriformia vel late lageniformia, raro fere cylindrica, 30-40/8–12 μ ad apicem 6–9 μ lata (Fig. 415 *a*, *b*). Cystidia faciei lamellarum copiosa, obtuse lageniformia, utriformia vel vesiculoso-fusiformia, tenui-tunicata, 36–50/8–16 μ ad apicem 8–11 μ lata (Fig. 415*c*). Hyphae cuticulae pilei filamentosae 5–25 μ latae.

In salicetis, Epsom Common, Surrey, 4 Oct. 1952 (typus in Herb. Kew.). G. nana proxime accedit, sed a cystidiis latioribus tenui-tunicatis sporis parvioribus basidiis 4-sporigeris, habitu leviter robustiore differt. Habitatio probabiliter diagnosticus est.

Cap 10–25 mm., convex then expanded, *generally papillate* or acutely umbonate, less commonly obtusely umbonate, *yellow-rusty, tawny-honey or tawny-rusty*, often with yellower margin or date-brown at centre, drying yellowish with tawny tinge at centre or entirely yellowish, striate when moist, margin with a few yellowish fibrils from veil when young. *Gills* adnate *often with tooth or adnato-decurrent*, yellowish honey then rusty-honey, subdistant, L 14–24 l 1–3, rarely veined on the sides, edge even or becoming flocculose. *Stem* 15–35/1½–3(4) mm., equal or slightly swollen at base, often flexuose, honey or concolorous with cap, *soon date-brown or bay from the base*, whitish or yellowish veil forming rather fugacious ring-zone and patches below this, stem later appearing yellowish striate in lower part, apex yellowish pruinose at first, stuffed or slightly hollow. *Flesh* concolorous, drying yellowish in centre of cap and stem. *Smell* and *taste* mealy. *Spores* amygdaliform, (*7*)7½–9(*10*)/(*4*)4½–5(*5½*) μ, punctate, sometimes a small germ pore is visible (Fig. 279). *Basidia* 4-spored, 20–28/5–7 μ. *Marginal cystidia utriform or broadly lageniform*, rarely ± cylindric, 30–40/8–12 μ, apex 6–9 μ (Fig. 415*a*, *b*). *Facial cystidia* numerous, *broadly lageniform, utriform or vesiculose-fusiform*, thin-walled, 36–50/8–16 μ, apex 8–11 μ (Fig. 415*c*). Hyphae of cap cuticle filamentous, 5–25 μ diam.

About base of willows or on old willow stumps. Epsom Common, Surrey, 4 Oct. 1952 (type in Herb. Kew); Dawlish Warren, Devon, 29 Oct. 1955. Nearest to *G. nana*, but differing in broader thin-walled cystidia not crested at apex, smaller spores, 4-spored basidia, slightly more robust habit and probably habitat. Also resembles *G. badipes* in colours, but spores, cystidia and habitat are different. So far only found in association with *Salix* spp. This fungus is described in the notebooks of Pearson under the epithet *pseudobadipes*, unfortunately previously validly used by Josserand (1955).

GYMNOPILUS DECIPIENS (W. G. Smith) P. D. Orton (see p. 176 and Fig. 280)

Whilst collecting agarics on a heath in Norfolk in Oct. 1958 I came across one which was clearly *Gymnopilus* sp. growing on burnt ground. It seemed also to agree macroscopically with the diagnosis of *Agaricus* (*Flammula*) *decipiens* W. G. Smith described from 'burnt earth, charcoal, etc.' Examination of type material of *A. decipiens* confirmed the microscopic features also. I give a fresh description of this species from my material:

Cap 9–28 mm., convex or conico-convex then expanded, sometimes obtusely umbonate, dirty yellowish when young soon rusty-tawny or -honey, sometimes darker at centre, less commonly paler (dirty whitish), *entirely minutely floccose-scaly or tomentose* or almost pilose-tomentose at centre, sometimes becoming almost smooth when old, margin often slightly torn or more rarely fibrillose-rimose. *Gills* adnate often emarginate or with tooth, ventricose or not, deep sulphur or golden-yellow soon tinged ochre or rusty finally deep rusty, subcrowded L 20–24 l 1–3, edge yellow flocculose then rusty-flocculose. *Stem* 10–22/1½–3 mm., equal or with slightly swollen base, *lemon- to golden-yellow soon tinged honey or rusty-tawny from base*, sometimes finally vandyke except for persistently yellow apex, *apex yellow-pruinose* and sometimes striate from gills, yellow veil forming fugacious ring-zone, stem yellow silky-fibrillose striate below this, then ± smooth in lower part, narrowly hollow, base sometimes pale yellowish tomentose. *Flesh* golden-yellow in cap, soon rusty-tawny to almost vandyke in stem. *Smell* none. *Taste* mild, pleasant fungussy. *Spores* 7–9/4–5 μ, ellipsoid slightly amygdaliform, punctate (Fig. 280*b*). *Basidia* 4-spored, 24–30/6–7 μ. *Marginal cystidia* capitate lageniform, 24–38/5–7(8) μ, apex 3–4(6) μ. No *facial cystidia* seen. Hyphae of cap cuticle filamentous, mostly strongly encrusted-pigmented, often diagonally striped, 5–18(22) μ diam., clamped.

Singly or in twos and threes in short moss on burnt soil, Buxton Heath, Norfolk, 5 Oct. 1958. Readily recognized by dark colours of lower stem, yellow pruinose stem apex, mild taste, spores and habitat. In my collection a few specimens had caps pale at the centre, but none 'almost white' as in the diagnosis of W. G. Smith; however, I think this difference can be ignored. Spores of type material were 7–9(10)/4–5 μ (Fig. 280*a*), ellipsoid-slightly amygdaliform, and punctate and hyphae of cap cuticle heavily encrusted-pigmented (about 10 μ diam. when revived in NH_4OH). I have also seen this fungus about burnt pine stumps at Esher and Witley Common, Surrey, but have no detailed notes of these collections. *Gymnopilus odini* (Fr.) Kühn. & Romagn. (*Bull. Soc. Nat. Oyonnax*, **10–11** (1957), Suppl. 81) seems very close, but is said to smell and taste mealy and to have the cap 'glabre ou diffracté en fines mêches fibrilleuses apprimées', spores 6–8/$3\frac{1}{2}$–$4\frac{1}{2}$ and marginal cystidia *ca.* 18–25/8–10; in view of these differences, especially the smooth cap, I prefer to keep my fungus separate pending further study.

GYMNOPILUS JUNONIUS (Fr.) P. D. Orton (see p. 176)

The separation of *Pholiota junonia* from the fungus known in Europe in the past as *P. spectabilis* does not seem to me justified either at specific or varietal level. In the original diagnoses *Agaricus junonius* differs only in smaller size and smooth cap. Examination of clumps of *spectabilis* has shown me more than once a small specimen of dimensions given for *junonius* joined to large robust specimens in one clump, and also that the cap varies from smooth or innately fibrillose to distinctly adpressedly scaly but usually still with smooth centre. I therefore regard *A. junonius* Fr., 1821, as the same as *A. spectabilis* Fr., 1828, and since the epithet *junonius* has priority have used it for this fungus. Also, *A. spectabilis* Fr., 1828, is a later homonym of *A. spectabilis* Weinm., 1824 (= *Phaeolepiota aurea*) so that the epithet *spectabilis* should not be used for the caespitose *Gymnopilus*.

Hebeloma leucosarx sp.nov. (Figs. 47–49)

Pileus 22–58 mm., e convexo expansus vulgo late obtuse umbonatus, senectute planus orbicularis vel ad marginem undulato-lobatus, sordide incarnato-ochraceus vel pallide fulvo-ochraceus, vulgo ad marginem pallidiore vel ad discum obscuriore coloratus, jove pluvio viscidus, jove sicco glaber, ad marginem primo eleganter albo-tomentosus mox glabrescens. Lamellae adnatae ± emarginatae, pallide argillaceae vel sordide incarnato-ochraceae (colorem marginis pilei accedentes) postremo argillaceo-luteolo-brunneae, confertae, L 40–66 l (1)3(7), ad aciem juventute conspicue albo-floccosae, jove pluvio plorantes. Stipes 25–90/$3\frac{1}{2}$–11 mm. (infra 5–18), aequalis vel clavato-bulbosus, albus dein praecipue ad basim pallide sordido-ochraceus, primo totus albo-pruinosus dein infra albo-sericeo striatus, e farcto cavus. Caro alba, in cortice stipitis sordide ochraceotincta, intus solum vulnerato leviter decolorans. Odor fortis, raphanoideus. Sapor mitis dein acris. Sporae limoniformes, punctatae, 9–12(14)/5½–6½ μ. Basidia 4-sporigera 24–30/8–9 μ. Cystidia aciei lamellarum ± clavata 40–60/4–6 μ ad apicem (5)7–13 μ; cellulae similes ad apicem stipitis adsunt.

Gregarius, ad terram humidam in salicetis betuletisque. Loch Loy, Morayshire, 25 Sept. 1955 (typus in Herb. Kew.). A carne plerumque alba, acie lamellarum plorante, margine pilei primo albotomentoso et coloribus insignis.

Cap 22–58 mm., convex then expanded often broadly obtusely umbonate, finally ± plane and orbicular or with wavy-lobed margin, pinkish buff or pale tawny-ochraceous, often with paler margin and darker centre, viscid when moist, smooth when dry with white silky sheen, *margin at first finely white tomentose* soon becoming smooth. *Gills* adnate ± emarginate, pale clay then clay-buff or pale pinkish buff (almost colour of cap margin) finally clay-snuff, crowded, L 40–66 l (1)3(7), edge white flocculose conspicuously so when young, *weeping in wet weather*. *Stem* 25–90/3½–11 mm. (5–18 mm. at base), equal or clavate-bulbous (sometimes markedly so), white then discoloured pale dirty ochraceous especially in lower part, at first entirely white pruinose then white silky striate in lower part, stuffed then hollow. *Flesh white*, tinged dirty ochraceous in stem cortex, discolouring slightly in centre only when bruised. *Smell* strong of radishes. *Taste* mild then strongly bitter. *Spores* limoniform, punctate, 9–12(14)/5½–6½ μ. *Basidia* 4-spored, 24–30/8–9 μ. *Marginal cystidia* ± clavate, 40–60/4–6 μ, apex (5)7–13 μ; similar cells form pruina at stem apex.

Gregarious on damp ground under willows or birches. Loch Loy, Morayshire, 25 Sept. 1955 (type in Herb. Kew); Little Brechin, Angus, 2 Sept. 1954; Bookham Common, Surrey, 15 Oct. 1955; Kilmington, Devon, 31 Oct. 1956; Thack Marsh, Surlingham, Norfolk, 5 Sept. 1959. Recognized by flesh for the most part white, weeping gills, tomentose edge of young cap and pinkish-buff colours.

Hygrophoropsis fuscosquamula sp.nov. (Figs. 39–42)

Pileus 6–50 mm., e convexo expansus, primo vulgo umbonatus dein ad discum leviter depressus, ad marginem senectute vulgo undulato-lobatus, albido-cremeus vel pallide luteolo-ochraceus, interdum senectute praecipue ad discum obscuriore ochraceus, primo squamulis fibrillosis parvis numerosis olivaceo-brunneis vel fuscis totus obtectus, dein expansione pilei sparsiore squamulosus (interdum senectute squamulis solum ad discum adsunt). Lamellae longe decurrentes, angustissimae, repetito furcatae, ex albo cremeo-albidae vel pallide ochraceae, siccitate obscuriore ochraceae, subconfertae, L 11–24, 3–4-plice furcatae, interdum undulatae vel senectute intervenosae, ad aciem primo crassae obtusae dein magis acutae. Stipes 15–50/2–4 mm., aequalis vel infra leviter incrassatus, vulgo flexuosus, primo pallide ochraceus ad apicem albidus dein sordide vel luteolo-ochraceus, interdum infra olivaceo vel sordide-brunneo tinctus, tomentoso-pruinosus, infra aut squamulis eis pilei similibus obtectus aut sine squamulis, ad basim albido-tomentosus, solidus sed mox mollis. Caro alba, interdum ad basim stipitis sordide brunneo vel ochraceo tincta. Odor nullus. Sporae oblongo-ellipsoideae, raro levissime phaseoliformes, + Melzer rubrobrunneae, 6–8/3½–4½ μ. Basidia 4-sporigera. Acies lamellarum fertilis. Hyphae cuticulae pilei filamentosae 2–6 μ latae, squamularum latiores, cellulae cylindricae vel cylindrico-clavatae, brunneo-vacuolatae, 75–120(150)/12–16 μ.

Gregarius, ad terram in locis humidis. Sub Junco confuso, Speech House, Glos., 11 Sept. 1955 (legit J. T. Palmer; typus in Herb. Kew.). A H. aurantiaca pileo olivaceo-brunneo vel fusco squamuloso, coloribus et habitatione differt.

Cap 6–50 mm., convex then expanded, often umbonate at first then slightly depressed at centre, *whitish cream or pale yellowish ochraceous*, sometimes becoming deeper ochraceous especially at the centre, *at first with numerous olive-brown to sepia small fibrillose squamules* which become dispersed as cap expands and may be visible only at the centre on older specimens, margin often becoming wavy-lobed when old. *Gills* deeply decurrent, very narrow, repeatedly forked, *pure white then creamy whitish to pale ochraceous*, drying deeper ochraceous, subcrowded, L 11–24 forking 3 or 4 times, sometimes wavy or interveined when old, edge thick and blunt at first, thinner and sharper when old. *Stem* 15–50/2–4 mm., equal or slightly thickened at base, often flexuose, at first pale ochraceous with whitish apex then dirty or yellowish ochraceous, sometimes tinged olive-brown or pallid from base up, lower part with or without darker scales as on cap, solid soon soft, base whitish tomentose. *Flesh* white, sometimes tinged pallid or ochraceous in base of stem. *Smell* none. *Spores* oblong-ellipsoid, rarely very slightly phaseoliform, red-brown in Melzer, $6–8/3\frac{1}{2}–4\frac{1}{2}\,\mu$. *Basidia* 4-spored. *Gill edge* fertile. Hyphae on cap filamentous, $2–6\,\mu$ diam., those of scales broader with cylindric or cylindric-clavate cells with brownish contents, $75–120(150)/12–16\,\mu$.

Gregarious in wet places; under *Juncus confusus*, Speech House, Glos., 11 Sept. 1955 (legit J. T. Palmer; type in Herb. Kew); under willows, Bookham Common, Surrey, 15 Oct. 1955; under alder, willow and *J. effusus*, Mortimer, Berks, 17 Oct. 1955. Differs from *H. aurantiaca* in dark scaly cap as well as colours and habitat.

HYGROPHORUS

In 1958 there was a period when woodland agarics were difficult to find owing to weather conditions, with the result that I gave more careful attention than usual to grassland fungi, which were quite abundant at the time. I examined large numbers of specimens of *Hygrophorus*, especially subgen. HYGROCYBE but also some of CAMAROPHYLLUS from different parts of the country. I was therefore able to confirm suspicions I had held previously that these fungi had not been sufficiently carefully studied in Britain in recent times. The works of Haller in Switzerland, who had plainly come to a similar conclusion there, were originally responsible for starting me thinking about this problem. Therefore I am now describing one new species of subgen. CAMAROPHYLLUS (*H. berkeleyi*) for a not uncommon fungus probably in the past regarded as a pale *pratensis* or as *virgineus*, and illustrated as *H. pratensis* var. *pallidus* in Cooke, *Illustrations of British Fungi*; I find this fungus quite recognizable in the field with characteristic gill-colour and seemingly constant in its features and not in any way connected to *pratensis* by intermediates despite similar spores, so that, pending evidence to the contrary I prefer to keep it separate.

In subgen. HYGROCYBE there is much work yet to be done, especially among the blackening species, but I am describing eight new species (two of which are renamings of misidentifications) and giving full descriptions of some others, one originally described from North America (*H. subminutulus*), which will be found first recorded in the notes of Pearson now in Herb.

Kew, and one (*H. schulzeri*) originally described by Bresadola from Italy but not well known or overlooked elsewhere. I have prepared keys for identification of the species of these subgenera, as far as my present knowledge permits, based on field work wherever possible, which I hope may help others to make more critical determinations of these rather attractive but sometimes bewildering fungi. It is not, I am sorry to say, any longer sufficient to say of a deep red *Hygrophorus* of small to medium size with red gills that it must therefore be *H. coccineus*, nor of a slimy yellow one *H. chlorophanus*; study your collection more carefully, noting changes of colours in cap and gills, gill attachment and spore details and you may find you have clearly found something quite different.

Key to the species of Hygrophorus *subgen. Camarophyllus*

1. Smell strong, disagreeable stercoraceous; cap cuticle cellular; colours dark sepia or vandyke brownish; spores subglobose 4½–6/4–5 μ; small, cap 5–15(20) mm.; chiefly in woods, uncommon *foetens*

1. Smell, if any, different or characters otherwise **2**

  2. Whitish, creamy or pale ochraceous; cap cuticle filamentous **3**

  2. In some part darker coloured; cap cuticle cellular or filamentous **6**

3. Smell strong (more particularly after being enclosed in a tin), fragrant aromatic, of russia leather; small (cap 5–20 mm.); spores 7–9/4–5 μ; in fields, not uncommon *russocoriaceus*

3. Smell none or faint fungussy; small to medium (cap up to 50 mm.) more rarely larger; mostly in fields but occasionally in woods, probably originally pastureland **4**

  4. Gills at first ivory, soon cream then ochraceous-cream; cap also soon ivory or cream at least at centre; spores broadly ellipsoid or tear-drop shaped, 6–8/4–6 μ (Fig. 281), basidia 4-spored; not uncommon *berkeleyi*

  4. Gills white or whitish, in *virgineus* sometimes tinged ivory when old; cap white or whitish, sometimes discoloured ivory or creamy when old **5**

5. Spores 9–12/5–6 μ, ellipsoid or slightly amygdaliform with large oblique apiculus; basidia 4-spored; usually relatively robust (cap 30–70 mm.) with thick distant gills; uncommon *virgineus**

5. Spores 7–9(10)/4–5(6) μ, ellipsoid or slightly oblong 4-spored *or* 10–12/5–6 μ 2-spored; usually small but sometimes larger (cap up to 64 mm.); very common *niveus**

  6. Cap cuticle cellular (usually atomate when dry); small agarics with subglobose or broadly ellipsoid spores; usually in woods, occasionally in grass **7**

  6. Cap cuticle filamentous (with silky sheen when dry); small to large grassland species; spores various **9**

7. Cap and stem pale yellowish-brown or tinged olivaceous; gills darker sepia brown; uncommon *micaceus*

7. Cap, gills and stem grey-brown, umber or sepia, sometimes dirty buff when dry **8**

  8. Stem with blackish fibrillose-floccose scales at least at apex; gills grey-horn or grey-sepia occasionally with slight pinkish tinge; spores 4–6/3½–5 μ; not uncommon *atropunctus*

  8. Stem without blackish scales; gills pallid-buff, pale sepia or tinged vandyke; spores 4–5/3¾–4½ μ; uncommon *hymenocephalus*

* Fruit-body size is no criterion for separating *niveus* and *virgineus*; *virgineus* does seem to be consistently larger and coarser (so far as my few collections show), but I have also found large coarse specimens of *niveus*, as evidenced by the smaller spores, in company with smaller specimens; *niveus*, *virginius* and *berkeleyi* are all prone to a pathological condition (not investigated—perhaps, bacterial) in which the stem or cap surface turns pink in places; this is var. *roseipes* of older authors, a worthless name.

9. Cap, gills and stem tawny-buff or reddish ochraceous; often robust, with broadly umbonate cap; spores broadly ovoid or subglobose, 5–7/4–5½ μ; very common *pratensis*

9. Colours otherwise; often more slender **10**

10. Stem distinctly yellowish at base, slate- or glaucous-grey above; often rather coarse and robust, cap 20–60 mm.; spores subglobose or broadly ovoid, 6–8/5–6½ μ, 4-spored; not uncommon *lacmus*

10. Stem not yellowish at base, white, greyish or brownish **11**

11. Colours predominantly umber or reddish brown (in *subradiatus* sometimes at cap centre only) **12**

11. Colours *either* predominantly violaceous-grey (sometimes drying brownish) *or* tin-grey; all uncommon **13**

12. Gills whitish or flushed colour of cap only slightly and usually near flesh of cap; cap white or whitish at margin, umber or reddish brown at disk, radiato-striate when moist; spores 7–9/4½–6 μ; small to medium (cap 10–40 mm.); common *subradiatus*

12. Gills coloured like cap but paler; cap umber or reddish brown, striate at edge when moist; spores 7–9/5–6 μ; generally medium (cap about 25–60 mm.); uncommon *colemannianus*

13. Cap, gills and stem uniformly tin-grey; spores broadly ovoid; 7–8½/4½–5½ μ; size medium, stem 5–10 mm. diam. *cinereus*

13. Cap violaceous-grey with darker vandyke or brownish centre; gills slate-grey or with slight tinge of cap colour; stem pale slate-grey or whitish grey; spores subglobose or broadly ovoid, 6–8/4½–6 μ, 4-spored; rather slender, stem 3–6 mm. diam. *subviolaceus*

Key to the species of Hygrophorus *subgen. Hygrocybe*

Before using this key it is useful to have notes on colours, gill attachment, spore details, and any unusual smell; basidia are 4-spored and gill edge is fertile unless otherwise stated; compressed stem is not diagnostic, as examples of many species can be found with or without the stem compressed or channelled. For synonymy see 'List', Part I B.

1. In some part yellow, orange, red, greenish, lilac or violaceous (some species bruise blackish) **2**

1. Whitish or dull coloured (some shade of grey or brown to blackish) occasionally bruising reddish **50**

2. Gills ± decurrent, broadly adnate or adnate with tooth (sometimes separating when old and then appearing free) **3**

2. Gills adnate emarginate, narrowly adnate or free (not broadly adnate, i.e. not attached by more than two-thirds of broadest width) **27**

Bright coloured species with broadly adnate or decurrent gills

3. Cap soon becoming torn into scales (scurfy-fibrillose to distinctly reflexed fibrillose-scaly) at least at centre, ± dry, orange-yellow or vermilion to blood-red, edge sometimes crenate or fringed-dentate; often growing in damp places **4**

3. Cap smooth or with silky sheen, rarely slightly radially fibrillose, dry or viscid, some shade of red, yellow or green, edge not usually crenate or fringed-dentate **10**

4. Gills persistently pure white; small; cap 7½–15 mm., scarlet becoming yellowish, scales concolorous; stem 20–35/2–3 mm., concolorous; spores ellipsoid-ovoid, 7–8(10)/4–5(6) μ; in moss in damp pastures and on peaty soil (*miniato-albus* Pat.; no Brit. record, see Møller FF 154)

4. Gills soon yellowish or reddish **5**

5. Gills at first vermilion to orange-red, often yellower at edge; usually in grass; cap blood-red, scarlet or vermilion, paling to orange or yellow, scales

concolorous; spores 7½–10(11)/5–6(7) μ, ellipsoid or ellipsoid-oblong; not common *miniatus*

5. Gills whitish or yellow at first then deeper yellow, or if becoming orange or red, then spores narrower (4–5 μ diam.) or constricted 9–11/5–6 μ **6**

6. Cap with darker brownish or blackish scales on a yellow, orange or scarlet background; usually in wet places, e.g. in *Sphagnum* or under *Molinia* tussocks; probably not uncommon; cap 10–30 mm. **7**

6. Cap with scales concolorous or paler than yellow, orange or red background **8**

7. Cap chrome-yellow or orange, sometimes reddish in places, with sepia or dark-brown scales at least in centre part, drying yellower, margin soon yellow, fringed-dentate or lacerate; spores 8–11(12)/4½–5½ μ, ellipsoid or slightly phaseoliform, occasionally slightly constricted (Fig. 286); gills adnate with tooth or subdecurrent, whitish then pale chrome-yellow; stem 17–40/2–6 mm., deep chrome often tinged orange-red in places *turundus*

7. Cap scarlet or vermilion, drying or discolouring orange or yellowish, margin often more persistently red, with small brownish erect fibrillose scales at least at centre, which turn darker brown or blackish, margin incurved for a long time and often crenate; spores 10–13(14)/6–8 μ, ellipsoid (Fig. 283); gills arcuate or deeply decurrent, white then whitish or pale yellow sometimes deeper yellow or orange at base; stem 10–35/1–4 mm., scarlet, vermilion or orange-red discolouring orange-yellow or yellow *coccineocrenatus*

8. Cap with orange-yellow or golden small ± pointed scales on concolorous background, 5–20 mm.; spores 8–9/4–5 μ, ellipsoid; gills adnate or subdecurrent, pale orange-yellow; stem same colour, 10–30/1½–4 mm.; in grass or in woods; uncommon *mollis*

8. Cap scarlet or vermilion often with yellow margin or discolouring yellowish, entirely or in part scurfy-scaly or scurfy-fibrillose at least when dry **9***

9. Gills soon arcuate or deeply decurrent, pale yellowish or rarely reddish then deeper sulphur-yellow; spores 8–10/5–6 μ, ellipsoid or ellipsoid-oblong; cap 5–40 mm., scarlet or deep carmine-red then vermilion or orange-red often with yellower margin, entirely scurfy-scaly at first, margin sometimes becoming smooth often crenate or wavy; stem 30–70/1–3 mm., concolorous or pale orange above and yellow below; in mossy grass or *Sphagnum*, not uncommon *cantharellus*

9. Gills more commonly adnate but sometimes arcuate decurrent, pale then deep chrome-yellow, soon flushed orange or scarlet from base; spores 6½–9/(3½)4–5 μ, ellipsoid-ovoid or -oblong, sometimes constricted **25**

10. In some part lilac or violaceous **11**

10. Without these colours **12**

11. Gills pale lilac, sometimes with faint yellow flush near flesh of cap; cap and stem very viscid; spores 6–8/3½–4½ μ, ellipsoid amygdaliform (Fig. 289); cap 10–25 mm., chrome-yellow with slight violaceous tinge at centre or round margin or in places; gills arcuate decurrent; stem 35–60/1–2 mm., pale lilac above, whitish or yellowish below; in moss under heather; uncommon *xanthochrous*

11. Gills pale dirty ochraceous, not lilac or only very slightly violaceous near flesh of cap; cap and stem not or slightly viscid; spores 7½–9½/5–6 μ, broadly ellipsoid; cap 10–20 mm., tawny yellow-brown or ochraceous, tinged violaceous especially at centre which may be violaceous-umber; gills deeply decurrent, sometimes forking; stem 13–35/1½–3 mm., violaceous (often rather deeply so, especially at apex); on peat etc., above 2000 ft.; uncommon *lilacinus*

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* A fungus recently sent me by R. Watling from Yorks. would key out here and may be a new species, but must await later description; spores broadly ovoid with large apiculus 6½–8/4½–6 μ; cap 10–16 mm., scarlet or orange-scarlet with golden-yellow scales at least at centre; gills decurrent, whitish then flushed orange-yellow or scarlet; stem 15–35/3 mm., orange or scarlet with yellow base, apex with yellow fibrils; flesh red in cap and stem-cortex, orange in centre of cap and stem; in grass on peaty soil.

12. Gills whitish grey to whitish flesh (sometimes rather deeply decurrent); cap pale flesh or pale tawny to orange-red, very viscid with grey gluten; stem concolorous often green or grey at apex, very viscid, rather tough; gill edge with numerous projecting thread-like hyphae 1–1½ μ diam.; in grass or on moors, common *laetus*

12. Gills more distinctly yellow, red or brick; cap often brighter, dry or viscid; stem not green or grey at apex (except sometimes greenish in *subminutulus*), often fragile; gill edge without projecting thread-like hyphae **13**

13. Gills pale to deep rose-red or brick-red, scarcely changing colour; in grass, uncommon **14**

13. Gills scarlet, vermilion, orange, yellow or whitish yellow **15**

14. Spores 6–8/4–5 μ, ellipsoid; cap and stem rosy pink or pale brick; gills concolorous or paler *sciophanoides*

14. Spores 7–9/5–6½ μ, ellipsoid-ovoid; cap and stem tawny-brick or blood-red, paling with age or when dry; gills rose-, brick- or orange-blood red *sciophanus*

15. Gills blood-red or purplish red often with yellow margin (entirely yellow in very young specimens only); prevailing colour deep blood-red; taste mild **16**

15. Gills whitish, yellowish or orange (becoming orange-vermilion, orange-scarlet or scarlet-red at least near flesh of cap in *quietus*, *reai*, *substrangulatus*, *strangulatus* and *marchii*); yellow, orange or scarlet-red prevailing **17**

16. Large and robust (cap 50–105 mm., stem 65–110/12–20 mm.) with conspicuously fibrillose-striate stem; cap deep blood-red or cherry-red fading to pale yellowish or whitish *puniceus* (see § 39)

16. Medium size (cap 13–50 mm., stem 2–6 mm. diam., < 10 mm. when compressed); stem smooth or minutely silky striate in places; cap and at least upper stem blood-red or cherry-red fading to orange-buff or ochre; cap soon dry and smooth; spores 7–9/4–5 μ, ellipsoid or slightly amygdaliform, sometimes slightly constricted in some views; common (Figs. 83–85, 284) *coccineus*

17. Smell oily when rubbed (especially gills), like *Lactarius quietus*; spores 7–10/4–5 μ, ellipsoid-oblong, constricted in some views; taste mild; cap medium 20–50(75) mm., orange or chrome-yellow becoming paler or sometimes dirty olive-yellowish, not viscid when moist but greasy to touch and shiny, drying matt; gills pale chrome-yellow becoming deeper yellow with orange flush at base, finally pinkish-orange; in grass, not uncommon *quietus*

17. Inodorous or with faint smell, not oily like *L. quietus* when rubbed; if spores constricted, then taste bitter *or* cap more viscid *or* less than 15 mm. when expanded *or* more scarlet-red *or* gills persistently yellow **18**

18. Taste bitter; spores 6½–9/4–5 μ, ellipsoid-oblong or slightly amygdaliform, often strongly constricted in some views (Fig. 299); gills adnate with tooth sometimes very broadly so, pale then deep chrome-yellow, sometimes becoming flushed orange or red from base, edge more persistently yellow; cap 5–25 mm., convex to acutely conical or becoming expanded, scarlet or orange-red drying yellowish-orange or ochre with paler margin, viscid at first; in grass or in woods, not uncommon *reai*

18. Taste mild; if spores constricted, then cap differently shaped or coloured or gills more decurrent **19**

19. Cap persistently viscid (sometimes glutinous when young or very moist); stem markedly viscid at least at first, except greasy to dry in *insipidus* **20**

19. Cap soon dry or slightly greasy (like *Collybia bùtyracea*); stem ± dry **24**

20. Quite small; cap 5–22 mm., convex umbonate then expanded or slightly depressed with upturned edge, scarlet or orange-red fading to chrome-yellow at least in places; stem 14–35/1–2½ mm., scarlet or chrome- or lemon-yellow below, red colour persisting at apex, sometimes fading greenish; cap and stem very viscid at first; spores 5–7(8)/2½–3½(4) μ, ellipsoid-oblong, sometimes constricted in some views (Fig. 294); in grass, not uncommon *subminutulus*

20. Not so; if small, and spores 5–7/3–4 μ, then red colour not persisting at stem apex and not so pronounced in other parts **21**

21. Gills persistently deep lemon- to egg-yellow, arcuate decurrent; cap and stem lemon-yellow fading whitish and opaque never red or orange; spores 6–8/4½–5 μ, ellipsoid-ovoid; cap 10–20 mm., soon expanded, slightly umbilicate, margin often plicate-striate; stem often short, 10–35/1–3 mm.; in damp mossy grass; uncommon *vitellinus*

21. Not so; if cap and stem are without red or orange tints, then gills paler or spores different **22**

22. Spores 8–10½/4½–6 μ, ellipsoid; cap and stem scarlet-orange then pallid orange-yellow; basidia 2-spored; gills yellow, ± decurrent; cap *ca.* 20 mm., convex then expanded; stem up to 50/2½ mm.; in grass (*sciophanus* s. J. Lange (L 168 E) non al.)
(Perhaps also *mucronellus* of some authors; needs clarification, no Brit. record)

22. Spores smaller; cap and stem without or with less marked scarlet or orange tints except when quite young; basidia 2- or 4-spored; in grass **23**

23. Gills always pale (whitish yellow then pale lemon); prevailing colour lemon-yellow; spores 6½–8/3½–4 μ, ellipsoid or ellipsoid-oblong, sometimes slightly constricted; orange tints of young cap and stem apex when present soon fading to lemon-yellow; cap and stem ± persistently slimy-viscid; cap 5–25 mm.; not common *glutinipes*

23. Gills whitish or pale yellow becoming pale to deep chrome-yellow or sometimes with slight orange flush; cap scarlet-red or orange at first soon discolouring chrome-yellow from centre, but red sometimes persisting at margin in places; stem slightly viscid or greasy, soon dry; cap 8–43 mm., very viscid at first; spores (5½)6–8/3–3½(4) μ, ellipsoid-oblong sometimes slightly constricted; basidia (2)4-spored; stem concolorous or chrome-yellow at first, discolouring like cap (often dries red in exsiccata); common *insipidus*

24. Colours predominantly chrome- or wax-yellow (cap, gills and stem, but cap may be tinged orange near margin when young); spores 5–7/3–4 μ, ellipsoid-oblong sometimes constricted; gills pale then deep chrome- or wax-yellow; cap 13–27 mm., convex then expanded-convex, dry or slightly greasy, persistently wax-yellow drying only slightly paler; stem dry, sometimes with white tomentose base; in grass; not uncommon *ceraceus*

24. Colours predominantly scarlet-red, vermilion or orange, sometimes with yellow margin or drying orange-buff, ochre or yellowish; spores 6½–9/(3½)4–5 μ (Figs. 293, 296) or 9–12/5–7 μ (Fig. 297), ellipsoid-ovoid or ellipsoid-oblong, sometimes constricted; gills pale then deeper chrome and often flushed orange or scarlet from base **25**

25. Spores 6½–9/(3½)4–5 μ, ellipsoid-ovoid or ellipsoid-oblong, constricted in *strangulatus* **26**

25.* Spores 9–12/5–7 μ, ellipsoid-oblong often slightly strangulated in some views (Fig. 297); cap 9–24 mm., convex then expanded umbilicate, scarlet with vermilion or yellowish margin, drying yellowish and ochre streaky or dull ochraceous-orange and minutely scurfy-streaky or with silky sheen (golden-scurfy when young); stem 10–18/2–4 mm., concolorous or yellowish, smooth and ± shiny; in sandy soil or in grass; uncommon *substrangulatus*

26. Spores ellipsoid-oblong, constricted in some views, often strongly so, 7–9/4–5 μ (Fig. 296); cap 5–35 mm., scarlet or vermilion with extreme edge bright yellow, drying yellowish ochraceous or orange and minutely golden-scurfy, sometimes reflexed scurfy-scaly round centre when young, very hygrophanous; rather tough and frequently caespitose; on sandy soil under bracken and heather especially on heaths or in grass; not uncommon *strangulatus*

* If spores 8–10/5–6 μ, ellipsoid or ellipsoid-oblong, and gills persistently yellow and arcuate decurrent see *cantharellus*, § 9).

26. Spores ellipsoid-ovoid or ellipsoid, not or rarely very slightly constricted, 6½–8½/(3½)4–5 μ (Fig. 293); cap 18–48 mm., deep scarlet-red then orange-scarlet often with yellowish margin, pallid tawny-buff or dirty ochraceous-yellow when dry and with golden-yellow silky sheen (not scurfy or scaly); more fragile, less commonly solitary and perhaps more robust (Figs. 72, 73) and less noticeably hygrophanous; in grass in fields or in woods; common *marchii*

Bright coloured species with free or narrowly adnate gills

27. Cap blackish brown, very viscid with olive-brown gluten and virgate with blackish fibrils; no red tints; gills lemon-yellow; stem 40–70/6–10 mm., dry, yellowish, striate with brownish fibrils; spores 9–11/5½–7 μ, broadly ellipsoid-oblong; cap 10–60 mm.; in mossy grass, uncommon *spadiceus*

27. Not so; cap some shade of red or yellow but may blacken when bruised or in wet weather or with age **28**

28. Cap, gills and often stem pink or rose, fading with age or in places; cap 40–100 mm., acutely conical then expanded, acutely umbonate, margin upturned and often split; stem 60–120/10–20 mm., sometimes ± white, striate, fragile; spores 7–8/4½–5 μ, ellipsoid, in grass; not uncommon *calytraeformis*

28. Not so; colours or stature different **29**

29. Blackening when bruised, in wet weather or with age, especially cap centre, edge of gills and stem base; cap ± conical, often persistently so, but acutely or obtusely umbonate **30**

29. Not blackening thus (though *konradii*, *intermedius* and to a lesser extent *subglobisporus* may very slowly (12–24 hr.) turn slightly brownish or blackish, chiefly at edge of cap and gills and at base or cut surface of stem) **34**

30. Gills chrome-yellowish, soon flushed rose-red or scarlet from base, finally ± entirely carmine or cherry-red; spores oblong-cylindric sometimes slightly curved, with oblique apiculus, 9½–13/4–5 μ (Fig. 287); basidia 4-spored but 2-spored form may exist; cap 13–40 mm., carmine or cherry-red often with narrow yellow margin, sometimes drying or discolouring yellowish, reddish orange-brown or burnt-sienna streaky, umbo often blackening; stem 25–70/3–6 mm., lemon-yellow with apex often chrome-yellow or cap colour; gill edge sterile soon fertile; in grass especially near the sea; probably not uncommon *conicoides*

30. Gills whitish or yellowish then lemon-yellow or greyish, never red; spores less elongate or broader except in *olivaceoniger* **31**

31. Cap and stem not red or yellow; cap 28–38 mm., with dirty greenish or olive mixed with brown before blackening; stem 32–58/5–6 mm., whitish or greyish, apex sometimes tinged greenish ivory; spores cylindric-oblong sometimes slightly constricted or curved on one side, 9–12½/4½–5½ μ (Fig. 288); gills soon greenish ivory or dirty grey-greenish, gill edge sterile; in grass and moss, uncommon *olivaceoniger*

31. Cap and stem some shade of red or yellow before blackening; (old specimens of *conicus* or *nigrescens* may appear dull coloured but may be distinguished by shorter or broader spores) **32**

32. Cap small, 5–10 mm., acutely papillate, ⅔ striate from edge, deep red with chrome-yellow margin becoming streaked orange and red; gill edge with collapsing ± cylindric-fusiform cystidia projecting 30–100 μ; spores 9–12/4½–6½ μ, ellipsoid-oblong; in swamps and bogs
(*Hygrocybe conico-palustris* Haller, *Schweiz. Z. Pilzk.* 1953, 141, no Brit. record)

32. Cap larger, 10–60(90) mm., acutely or obtusely umbonate, often not or less strongly striate, scarlet, orange or yellow; gill edge sterile at first then fertile; usually in grass (*nigrescens* sometimes in woods), common **33**

33. Spores 7–9(10)/4–5(6) μ (4-spored) or 9–12/6–8 μ (2-spored), ellipsoid or ellipsoid-oblong; cap small to medium 16–40(60) mm., acutely umbonate, predominantly orange or yellow, occasionally with flush of red before blackening; stem slender 3–5(7) mm. diam.; in grass usually in open places *conicus*

33. Spores 8–11/5–6 μ (4-spored), ellipsoid or ellipsoid-oblong; cap medium to large 35–60(90) mm., often obtusely umbonate, predominantly red, scarlet or orange-scarlet, sometimes yellowish in places, often scarlet streaky when old; stem more robust 5–10 mm. diam.; in grass in fields or in woods sometimes on soil *nigrescens*

34. In some part with distinct green tinge (grassland species) **35**

34. Without distinct green tinge in any part **37**

35. Cap and stem very viscid; stem and often gills at first a deep green, persisting at stem apex; cap variously coloured, usually green at first then whitish, yellowish, brick colour or purplish; stem rather tough; spores 7½–10/4–6 μ, ellipsoid; very common *psittacinus*

35. Cap and stem soon dry; stem pale lemon- or greenish yellow with white base, 60–120/8–13 mm. **36**

36. Cap 10–40 mm., conico-convex, often acutely so at first, becoming expanded ± plane, sulphur-yellow then tinged green, innately fibrillose; spores 8–10/5–6 μ, ellipsoid-ovoid (gills white sec J. Lange but plate shows a faint green tinge); uncommon *citrinovirens*

36. Cap 40–75 mm., conico-convex then expanded with persistent acute umbo (shape like *calyptraeformis*), greenish yellow with pale yellower or ochraceous centre and deeper green margin, ± smooth at centre, radially silky fibrillose towards margin, often splitting radially; spores 5–7½/4–5½ μ, broadly ellipsoid or ovoid with prominent apiculus; gills white then tinged greyish green near base especially near margin of cap; uncommon *brevispora*

37. Medium to large with relatively robust stem (10 mm. or more diam.); predominantly red **38**

37. If large with robust stem, colours orange or yellow **40**

38. Cap 30–70 mm., dry, distinctly fibrillose-scaly at least at centre, margin often rimose, reddish orange or golden-yellow; stem dry, strongly fibrillose-striate, 9–17 mm. diam.; marginal cystidia numerous, fusiform, clavate or cylindric, 60–120/8–20 μ; not uncommon *intermedius* (see § 40)

38. Cap (20)30–120 mm., viscid *or* greasy-shiny when moist, when dry smooth and shiny *or* matt and occasionally slightly adpressed yellow scurfy; stem dry, smooth or fibrillose-striate, 5–30 mm. diam.; gill edge fertile **39**

39. Flesh white at base and in centre of stem, concolorous or yellow under cuticle; stem fibrillose-striate, yellow, flushed orange or blood-red, base white; cap 50–120 mm., deep blood- or cherry-red discolouring yellow or ochre from centre, finally entirely pale yellowish or dirty whitish, viscid or greasy-viscid with striate margin when moist; spores 8–12/4–6 μ, ellipsoid; common *puniceus*

39. Flesh yellow in stem centre, rarely white at extreme base only, concolorous under cuticles, ± red over gills; stem smooth, matt or silky-glossy when dry, cherry-red or deep carmine above, orange or yellow below or entirely yellow, base rarely white but sometimes white tomentose; cap 20–110 mm., bright cherry-red or deep carmine with slight purplish flush, drying slowly ochre or ochraceous-yellowish sometimes with opaque whitish sheen about centre, margin remaining red for a long time, but generally with very narrow bright yellow line at extreme margin, not more than slightly greasy when moist, not or very slightly striate; spores (7)7½–10/(4)4½–5½ μ, ellipsoid (Fig. 285); probably not uncommon *splendidissimus*

40. Cap 30–70 mm., dry, distinctly fibrillose-scaly at least at centre, margin often rimose, reddish orange or golden-yellow fading to yellowish or ochraceous-yellowish, margin more persistently orange-red, scales on centre often dark brownish with age; stem robust, 60–90/9–17 mm., dry, orange-red or -yellow often yellow at base and/or apex, strongly fibrillose-striate; marginal cystidia numerous, fusiform, clavate or cylindric, 60–120/8–20 μ; flesh whitish or very pale yellowish, slightly orange under cap cuticle; spores 8–11(12)/5–6(7) μ, ellipsoid or sometimes irregular; gills whitish or pale yellowish; stem and cap edge tend to turn very slowly brownish or blackish after handling or with age; not uncommon *intermedius*

40. Cap and stem dry or viscid; if cap with tendency to be scaly or stem fibrillose-striate, colours yellower *or* spores smaller *or* marginal cystidia absent **41**

41. Spores *either* 11–13(14)/5½–7½(8) μ (2-spored), ellipsoid-oblong *or* 6–10(11) μ diam. ((1–)2–4-spored), subglobose, broadly ovoid or pruniform (Figs. 292, 295, 298); cap viscid at first, ± conical, frequently acutely so (except *konradii*) **42**

41. Spores narrower, 4–6 μ broad, mostly ellipsoid or ellipsoid-oblong, sometimes constricted, but broadly ellipsoid or pruniform in *chlorophanus* and *obrusseus* and 5–6 μ broad; cap dry or viscid, most commonly obtuse (convex to plane or slightly depressed) but acute in *acutopunicea* and *aurantiosplendens* **44**

42. Spores ellipsoid-oblong, 11–14(15)/5½–7½(8) μ (Fig. 298), 2-spored; cap 30–60 mm., ± persistently acutely conical hardly expanding (like *conicus*), golden or lemon-yellow, sometimes orange or orange-red in places; stem and gills concolorous or yellow, does not turn brownish or blackish after handling; not uncommon *langei*

42. Spores subglobose, broadly ovoid or pruniform, 6–10(11) μ broad (Figs. 292, 295); cap *either* acutely conical, expanding or not, *or* more obtuse; often turns slowly brownish or blackish in places after handling **43**

43. Gills pale then soon deeper chrome-yellow or with slight orange flush; cap 30–70 mm., obtusely conical then expanded conical or slightly obtusely umbonate (Figs. 92, 93), entirely or at least at centre or margin orange or scarlet-red, sometimes mixed with chrome- or egg-yellow in places; spores 9–11(12)/6½–8(9) μ, broadly ovoid or pruniform (Fig. 292); basidia 4-spored; stem 50–80/7–15 mm.; in grass; uncommon *konradii*

43. Gills whitish then flushed lemon-yellow, always remaining pale, but sometimes deeper lemon near flesh of cap; cap 35–70 mm., acutely conical then expanded conical, sometimes with wavy-lobed and upturned margin as in *calyptraeformis*; chrome- or golden-yellow tinged orange or scarlet-red in places especially near margin; spores subglobose, broadly ovoid or pruniform (Fig. 295); number of sterigmata on the basidia of the same gill variable (1–)2–4 or (2–)–4 (spores 8–12/6–10 μ) *or* (1–)2 (spores (9)10–12(13½)/7–9(11) μ); stem 70–90/7–12 mm.; in fields or in woods; uncommon *subglobisporus*

44. Smell oily when rubbed (especially gills) like *Lactarius quietus*; spores 7–10/4–5 μ, ellipsoid-oblong, often constricted in some views; gills pale then deep chrome-yellow, then flushed orange from base, finally pinkish orange, adnate with tooth or decurrent but sometimes separating free as cap expands; cap 20–50(75) mm., convex then expanded, not viscid but greasy to touch and shiny, drying matt, orange or chrome-yellow, discolouring paler or dirty olive-yellowish; not uncommon *quietus* (see § 17)

44. Smell none or not oily when rubbed; if spores constricted and gills become flushed orange, other characters are different **45**

45. Stem persistently viscid, smooth, shiny but may be very minutely pruinose at first; gills whitish or pale lemon-yellow then deeper lemon near flesh of cap (never flushed orange); spores broadly ellipsoid or pruniform, 6½–9/4½–6 μ (Fig. 290); marginal cystidia absent; cap 20–70 mm., very viscid; cap and stem lemon or chrome-yellow, sometimes with orange flush in places when young; common *chlorophanus**

45. Stem soon dry, smooth or minutely pruinose or fibrillose-striate; gills mostly acquiring an orange or orange-red flush, but if persistently lemon-yellow, cap becoming ± radially fibrillose (*obrusseus*) *or* spores constricted (*aurantiosplendens*) **46**

* The consistently lemon-yellow gill is the best field character of this fungus together with smooth viscid cap and stem and obtuse cap; Haller says the stem is never channelled, but I have found specimens with channelled stems up to 14 mm. diam., which must certainly be referred to this species. I agree with him that the plate of Fries is as yet the only authentic one.

46. Spores broadly ovoid or pruniform, 7–9/5–6 μ; gills whitish to pale lemon-yellow, often deeper lemon at the base; cap 25–70 mm. lemon or golden-yellow soon dry, smooth then with orange-brown fibrils, sometimes splitting at margin or tinged olive when older; stem smooth, often compressed (up to 15 mm. diam.), deep lemon-yellow to ochre or orange with whitish base; marginal cystidia ± conical with acute apex, projecting up to 65 μ; not common *obrusseus*

46. Spores ellipsoid or ellipsoid-oblong (as Fig. 291), sometimes constricted in some views (as Fig. 282), 7–10/4–5 μ; gills pale to deep chrome-yellow then often flushed orange or orange-red from base (lemon-yellow with orange flush to entirely lemon in *aurantiosplendens*) **47**

47. Cap ± persistently viscid, drying smooth but opaque and matt, chrome, orange-yellow or vermilion (often scarlet-red in places to entirely red in *aurantiosplendens*) **48**

47. Cap greasy-shiny when moist, soon dry, drying minutely golden-scurfy or finely fibrillose, vermilion or entirely scarlet-red or orange-blood-red, frequently with extreme margin bright yellow, drying orange, ochraceous-yellowish or yellow **49**

48. Stem smooth, matt or polished, but minutely yellow pruinose under lens when fresh, 2–10 mm. diam.; spores 6½–9/4–5(5½) μ, ellipsoid or ellipsoid-slightly-ovoid with rather prominent oblique apiculus (Fig. 291); cap 20–50 mm., orange or vermilion with chrome-yellow margin to entirely chrome-yellow or with orange or vermilion tinge at centre or on one side only; gills pale then deep chrome yellow, usually becoming flushed orange from base; stem chrome-yellow or with orange flush in places; not uncommon *flavescens**

48. Stem smooth but minutely white silky striate when fresh, relatively robust, 6–15(22) mm. diam., sometimes orange-fibrillose in places; spores 7–9(10)/4–4½ μ, ellipsoid-oblong, often constricted in some views (Fig. 282); cap 20–80 mm., scarlet-red or orange-scarlet, discolouring orange, chrome-yellow or golden in places, red sometimes persisting especially near margin or at centre; gills chrome- or lemon-yellow generally with orange flush at base to entirely orange-chrome, often becoming pale chrome- or lemon-yellow when old; stem lemon or chrome-yellow with or without orange flush in places; all parts tend to lose red and orange (cf. *flavescens*); not uncommon *aurantiosplendens*

49. Stem egg-yellow, strongly striate with red fibrils, robust, 7–13 mm. diam.; cap 15–55 mm., orange-blood-red soon paling to orange and yellow, finely fibrillose, conico-convex with ± prominent acute or obtuse umbo, then expanded with upturned often split edge; spores 9–10/4–5 μ, elongate ellipsoid-oblong not constricted (*Hygrocybe acutopunicea* Haller) (= *H. acuta* F. H. Møller non *Hygrophorus acutus* Smith & Hesler, *Lloydia*, **5** (1942), 57; Møller, FF 143 and *Schweiz. Z. Pilzk.* 1956, 66, not yet British)

49. Stem scarlet-red or vermilion-orange, often chrome-yellow at base or apex, more slender, 1–6 mm. diam.; cap 5–35 mm., scarlet or vermilion with extreme edge bright yellow, drying yellowish ochraceous or orange and minutely golden-scurfy, convex then expanded or slightly depressed; spores 7–9/4–5 μ, ellipsoid-oblong, constricted (often strongly so) in some views (Fig. 293); rather tough and sometimes caespitose *strangulatus* (see § 26)

* Has been confused with *chlorophanus*, from which it is best distinguished by chrome-yellow sometimes orange-tinged but not lemon-yellow gills, drier stem and narrower spores; I think L 166 C, *obrusseus* most likely represents *flavescens*.

Dull coloured species

50. Cap and stem persistently glutinous-viscid, smoky-grey or grey-umber to sepia; gills whitish or greyish, often darker at base, broadly adnate sometimes with tooth; spores 6½–8/4–5 μ, ellipsoid; in grass, common *unguinosus**

50. Cap not persistently glutinous-viscid, in some species dry, in others greasy-shiny to moderately viscid; stem always soon dry; colours and spores various 51

51. Large and coarse with broad thick distant gills and faint to strong mealy smell, especially when cut; spores ellipsoid-oblong or slightly phaseoliform, amyloid, 6–8/3–3½ μ; all parts discolouring slowly (12–24 hr.) reddish then black when handled or with age; cap 44–150 mm., greyish-pallid or dirty date-brown then greyish-tan or dirty reddish brown; stem 60–90/13–35 mm. (at apex) equal but with pointed base or attenuated downwards, pale greyish or greyish pallid, base with creamy or dirty yellowish tinge at first; gills adnate, ± emarginate, often with tooth, pale then deeper grey or pallid-grey; in grass, uncommon *metapodius*

51. If large and coarse, then smell not mealy, *or* spores non-amyloid and often broader, *or* fungus darker when fresh or not discolouring reddish then black 52

52. Smell nitrous, often strong; cap soon dry, often radially fibrillose or becoming cracked-scaly; gills adnate-emarginate or ± free; spores (6½)7–10/4¼–6½(7) μ, ellipsoid-oblong or pruniform (Figs. 389, 390) or broadly ellipsoid or ovoid (Fig. 391); in grass 53

52. Smell none or mouldy-rank; cap viscid or not, smooth, silky-tomentose or fibrillose-scaly; gills narrowly adnate or free except sometimes shortly decurrent in *schulzeri* 55

53. Very dark agaric; spores broad, broadly ellipsoid or ovoid, 7–9(10)/5–6½(7) μ (Fig. 391); cap 20–80 mm., blackish sepia or dark vandyke with brighter umber or yellow-brown margin when fresh, drying pale- or olive-sepia; gills dark vandyke or sepia, bruising (as do stem and flesh) rather bright red (especially along the edge) then blackish brown, often very broad, thick and distant; stem robust, 30–60/6–12 mm. (up to 24 when compressed), sepia or olive-sepia often with slightly darker base; flesh concolorous; singly or in small clumps, not uncommon; smell none or nitrous *ovinus*

53. Colours paler at least in gills; spores (6½)7–10/4¼–5½(6) μ, ellipsoid-oblong or pruniform (Figs. 389, 390) 54

54. Not reddening when bruised or with age, sometimes not changing colour at all, sometimes turning very slowly blackish brown; gills whitish or creamy then pale horn or tinged cap colour; cap 11–80 mm., pale vandyke, sepia-horn or sepia-date-brown, often slightly brighter yellow-brown at margin when fresh, drying pallid or pale dirty buff; stem 30–100/3–12 mm., whitish pallid, creamy or pale dirty buff, often paler at apex; spores (6½)7–10/4¼–5½(6) μ (Fig. 390); not uncommon *nitratus*

54. At least gills, sometimes also cap and stem, reddening when bruised then slowly turning dark brown or blackish; gills whitish then creamy, grey-horn or pale olive-sepia; cap 15–100 mm., greyish-brown, sepia-horn or olive-horn darkening to vandyke or dark sepia-olive when wet or with age; stem 15–150/3–15 mm. (up to 17 when compressed), whitish or cream then discolouring like cap; spores 7½–10/4½–5½ μ (Fig. 389); uncommon; differs from *ovinus* (which may be inodorous) in persistently paler gills and narrower spores *nitiosus*

55. Very dark, rather robust and coarse, reddening then turning slowly black when bruised; spores broadly ellipsoid or ovoid, 7–9(10)/5–6½(7) μ (Fig. 391); smell none or nitrous *ovinus* (see § 53)

* There may be another rather similar agaric with subglobose spores *ca.* 8–9/7 μ, corresponding to *unguinosus* s. Bresadola, Rea and perhaps Cke 900 (934) *clarkii*; this awaits clarification, as does *irrigatus* s. Fries, which is said to be less fragile.

55. If dark, characters otherwise **56**

56. Blackening in places with age or when handled; cap dirty greenish or olive mixed with brown; stem whitish or greyish, apex sometimes tinged greenish ivory; gills pale yellow-greenish or greenish ivory then dirty grey-greenish; spores ellipsoid-oblong, 9–12½/4½–5½ μ (Fig. 288); uncommon *olivaceoniger* (see § 31)

56. Not blackening with age; not distinctly greenish or olive (except cap of *fornicatus* sometimes grey-olive); gills white or whitish or tinged sepia, never greenish; spores less than 9 μ long **57**

57. Spores subglobose, very minutely granular punctate sub immers., 3–4½/2½–3½ μ (Fig. 392); small agaric without smell or taste; cap 15–28 mm., convex then expanded or slightly depressed, vandyke or blackish sepia drying pallid-buff, smooth when wet but drying minutely adpressed silky tomentose or velvety; gills adnate, often emarginate to shortly decurrent; whitish then tinged sepia or cap colour; stem 18–35/3–6 mm. (< 10 when compressed), concolorous or paler; end cells of hyphae of cap cuticle elongate-clavate and ± erect; in grass, uncommon *schulzeri*

57. Spores *either* ellipsoid *or* subglobose larger and smooth sub immers.; medium to large (cap 25–84 mm.; stem 4–18 mm. diam.); smell none or mouldy-rank **58**

58. Cap and basal ¾ of stem everywhere covered with minute, adpressed sepia scales; spores subglobose 5–7/4–5½ μ; cap about 40 mm., convex then expanded, background colour to scales pale ochraceous, margin becoming 'rimosely incised' (sec Rea); gills adnate emarginate, white or pale brownish; stem about 60–70/10 mm., background colour white; smell none; in grass (needs a modern description) *lepidopus*

58. Minute sepia or dark brown scales sometimes on cap and at base of stem at first soon disappear; spores ellipsoid or ovoid, 5–6/3–4 μ or 6–8/4–5½ μ; cap convex then expanded often obtusely or slightly acutely umbonate; gills narrowly adnate emarginate to ± free **59**

59. Spores 5–6/3–4 μ, ellipsoid; gills cream or pale ochraceous; cap 30–40 mm., whitish or pale yellowish grey (especially at centre), viscid; stem 30–40/4–6 mm., white or cap colour; in grass; (in recent years described (?) only by Bresadola and Rea; needs a modern description; spore size and colours plainly different from *fornicatus*) *clivalis*

59. Spores 6–8/4–5½ μ, ellipsoid or ovoid; gills white then whitish or with slight grey tinge; cap 25–55 mm., pallid-grey, grey-clay or grey-olive with paler whitish margin, scarcely viscid, soon dry, smooth and shiny when moist, slightly adpressedly silky when dry especially at centre; stem 35–70/5–11 mm., white or whitish, at base often tinged greyish-brown or sometimes with fugacious minute dark brown squamules (sometimes also found on cap); gills and flesh sometimes discolouring slowly pinkish when cut or handled; smell sometimes mouldy-rank; in grass, not uncommon *fornicatus*

More work is needed on *fornicatus* sensu lato, *clivalis* and *lepidopus*. I am not sure whether the agaric with brown scales at the stem base and flesh or gills discolouring pinkish is the same as *fornicatus* s. Ricken (= *streptopus* s. Bresadola and Rea); small brown scales are mentioned in the original diagnosis of *fornicatus* by Fries (*Epicrisis* (1938), pp. 327, 328) and in *Monographia*; if there are two species here, *Agaricus streptopus* Secr., 1833, it should be noted, is a later homonym of *A. streptopus* Pers., 1828, *Mycologia Europaea*, III, 82, a hygrophanous fungus probably *Clitocybe hydrogamma*; in any case comparison of the descriptions suggests that it is doubtful if *H. streptopus* (Secr.) Fr. 1838 s. Fries is the same as *A. streptopus* Secr., 1833, s. Secretan.

HYGROPHORUS (HYGROPHORUS) *DICHROUS* Kühn. & Romagn.

This olivaceous-brown fungus of frondose woods is not uncommon in Britain; but the blue-green NH_4OH reaction of the hyphal incrustations of the cap cuticle is not constant for British material since a fungus from frondose woods, otherwise agreeing with the description of *H. dichrous* in *Flore Analytique*, p. 59, has been collected (once by me and once by Dr R. W. G. Dennis) which did not give this reaction either fresh or dried. Kühner & Romagnesi gave no Latin diagnosis for *H. dichrous*; and also the Bresadola plate quoted by them (FT I 92), though with a Latin description, is headed *H. olivaceo-albus* forma *obesus* and may not represent the same fungus as it is described by Bresadola from coniferous woods. In view of the apparent inconstancy of the ammonia reaction I prefer to leave the solution of this nomenclatural problem for the present.

The fungus has undoubtedly been recorded both as *H. olivaceo-albus* and *H. limacinus* in the past in Britain. *H. olivaceo-albus* was originally described as a coniferous species, is more slender and seems clearly defined by Kühner & Romagnesi (l.c., 60). Over the epithet *limacinus* there is much confusion. There is (1) *Agaricus limacinus* Scop. ex Fr., 1821, without olivaceous colours and which, from the original plate of Scopoli, I should say might be *H. mesotephrus*, but is best excluded for the present as doubtfully British; and (2) *A. limacinus* Schaeff. ex Pers., 1828, which from its original descriptions appears to be the fungus listed in Part I B of the 'List' as *H. dichrous*, but for which the epithet *limacinus* cannot be used because it is antedated by *A. limacinus* Scop. ex Fr., 1821. The situation is further complicated by the fact that in *Hymenomycetes Europaei* Fries appears to have combined the two and quotes as an illustration of *H. limacinus* (Scop. ex Fr.) Fr. the Saunders & Smith Pl. 28, but the latter is an olivaceous fungus of frondose woods. The epithet *limacinus* is therefore withheld from the British list until fungus (1) above is described from British material and established as a good species.

Another fungus in this group, *H. fusco-albus*, appears not to be well known but is easily recognized by the white stem with not more than a trace of coloured veil on it; it occurs under conifers, especially on chalk soil, and I have collected it in Surrey and believe it to be a good species; I think, however, that further work is required to clarify this group of species.

HYGROPHORUS (HYGROPHORUS) *MESOTEPHRUS* B. & Br. *Ann. Mag. nat. Hist.* Ser. 2, **13** (1854), 402 (Figs. 62, 63, 388)

In Hampshire in 1958 I collected a fungus, which I have since identified as *H.* (H.) *mesotephrus* s. B. & Br., Rea, Kühner & Romagnesi non Cooke, Boudier, J. Lange. Spores of the type material are ellipsoid or ellipsoid-ovoid, 9–12/6–8 μ (Fig. 388 *a*), in exact agreement with my Hampshire fungus which also agrees macroscopically with the original diagnosis, especially noteworthy being the colour ('cap white with disk brown, viscid striate', 'stem white' and 'in age the lower part of the stem is slightly stained but by no means squamose'). Cooke and Boudier used the epithet *mesotephrus* for *H.* (H.) *leucophaeus*, which has quite different colours, and

J. Lange depicts a fungus doubtfully distinct from *H. dichrous* as *Limacium mesotephrum.* Here is a description of my Hampshire fungus:

Cap 21–47 mm., convex then convex-expanded, sometimes slightly umbonate, *sepia or sepia-horn at centre with paler white or whitish margin*, very glutinous, smooth, sometimes striate-sulcate at margin. *Gills* adnate to subdecurrent, *white*, not crowded, L 24–30 l 1–3, sometimes slightly ventricose, edge even. *Stem* 56–110/4–8 mm., attenuated downwards, sometimes slightly fusiform at apex where glutinous veil ends (< 10 mm. diam.), *white* then sometimes discolouring *whitish or very pale brownish* in places, glutinous when fresh, apex white floccose-punctate, stuffed. *Flesh* white, whitish horny over gills and in stem cortex. *Smell* none. *Spores ellipsoid or broadly ovoid, 9–11(12)/6–8* μ (Fig. 388*b*). *Basidia* 4-spored, *ca.* 48–60/9–10 μ. *Gill edge* fertile. Hyphae of cap cuticle very narrow filamentous, 1–3 μ diam., no colour change in NH_4OH.

Under oaks (one group), Lyndhurst Road, Hants, 19 Nov. 1958. Differs from both *H. dichrous* and *H. olivaceo-albus* in lack of olive-brown gluten on cap and stem and from the latter in smaller spores.

Hygrophorus (*Camarophyllus*) **berkeleyi** sp.nov. (Figs. 50–54, 281)

Pileus 20–70 mm., e convexo expansus, vulgo primo umbonatus, umbone aut magno lateque aut parvo, postremo leviter depressus interdum margine erecto vel lobato-plicato, eburneus vel cremeus interdum ad marginem albidus, senectute sordide ochraceascens, jove pluvio exstriatus vel haud striatus sed interdum viscidulus, jove sicco opacus leviter sericeo-nitidus, ad discum senectute interdum in squamulas dehiscens. Lamellae decurrentes vel arcuato-decurrentes, interdum aliquantum latae, in exemplis magnis fere triangulares, rariore angustes, e cremeo-albido eburneae vel pallide cremeo-ochraceae postremo sordide luteolo-cremeae, subconfertae, L 18–50 l 1–3, interdum juxta stipitem furcatae, in exemplis magnis aliquantum crassae et ad faciem venosae vel intervenosae. Stipes 25–64/4–10(20) mm., vulgo deorsum attenuatus, rariore fere aequalis, interdum flexuosus, albidus dein colore pilei tinctus vel praecipue ad basim sordide ochraceus, albo-sericeo striatus, solidus vel farctus, ad basim albotomentosus. Caro pilei et mediae partis stipitis albida, in cortice et ad basim stipitis cremea vel sordide ochracea, interdum juxta lamellas colore cornus tincta. Odor nullus vel debilis. Sporae lacrimiformes vel late ellipsoideae, 6–8/4–6 μ (Fig. 281). Basidia 4-sporigera ca. 40–44/6–8 μ. Acies lamellarum fertilis.

Inter graminos, Membury, Devon, 3 Nov. 1956 (typus in Herb. Kew.). A H. niveo et H. virgineo lamellis cremeis differt; a H. niveo etiam coloribus pilei stipitisque, lamellis non persistente albidis, forma sporarum, H. virgineo etiam sporis minoribus differt. H. pratensis var. pallidus Cooke, 1874 (non H. pallidus Peck, 1902) idem censeo.

Cap 20–70 mm., convex then expanded often umbonate at first, umbo broad and obtuse or small, finally slightly depressed and sometimes with upturned or wavy-lobed margin, *ivory or cream, sometimes whitish at margin*, becoming dirty ochraceous when old, not or scarcely striate when moist but slightly viscid, matt and slightly silky shiny when dry, cuticle sometimes cracking into scales at centre when old. *Gills* decurrent or arcuate-decurrent, sometimes rather broad, in large specimens almost triangular, more rarely narrow, *creamy whitish then ivory or pale creamy ochraceous finally dirty yellowish cream*, subcrowded, L 18–50 l 1–3, sometimes forked near stem, in larger specimens rather thick and veined on sides or interveined. *Stem* 25–64/4–10(20) mm., often attenuated downwards, more rarely almost equal, sometimes flexuose, whitish then tinged cap colour or dirty ochraceous especially at base, white silky striate, stuffed then hollow, base white tomentose. *Flesh* of cap and middle stem whitish, in stem cortex and at base cream or dirty ochraceous, sometimes horny over gills, often thick at cap centre. *Smell* none or faint pleasant, fungussy. *Spores tear-drop shaped or broadly ellipsoid*, 6–8/4–6 μ (Fig. 281). *Basidia* 4-spored, *ca.* 40–44/6–8 μ. *Gill edge* fertile.

In grass, Devon: Membury, 3 Nov. 1956 (type in Herb. Kew), 25 Oct. 1957, and Bindon Landslip, Rousdon, 29 Nov., 2 Dec. 1958 (in wood which was pastureland within the last 150 years). Recognized by creamy or yellowish creamy gills and paler whitish or creamy cap and stem and tear-drop-shaped spores. *H. niveus* has ellipsoid or ellipsoid-oblong spores and is whiter with persistently white or whitish gills; *H. virgineus* has larger spores and is also paler with whitish gills. This is *H. pratensis* var. *pallidus* Cooke (non *H. pallidus* Peck, 1902); the citation Berk. & Br. sometimes given for var. *pallidus* is an error, the var. epithet having been applied by Cooke in *Handbook of British Fungi*, ed. II, 294, where he refers to Berk. & Br. *Notices* no. 1356, which is *H. pratensis* var., without a varietal epithet. There were several rings of this fungus growing in the field at Membury where I first collected it, all with fruit bodies of the colours as described above without any indication of the deeper colour of *pratensis*; one ring was marked and it produced similarly coloured fruit bodies in both 1956 and 1957; I have therefore no hesitation in describing this fungus as a separate species.

HYGROPHORUS (CAMAROPHYLLUS) *SUBVIOLACEUS* Peck (*Rep. N.Y. St. Mus.* **53** (1899), 842) (Figs. 506–507)

In 1957 in a wet field in East Devon I collected an unfamiliar small violaceous-grey, rather dry, hygrophanous species of *Hygrophorus*, which looked like a small specimen of *H.* (C.) *lacmus* without the yellow stem base. I believe this to be *H. subradiatus* s. Ricken, described as differently coloured from *H. subradiatus* s. Konrad & Maublanc, which I take to be that of Fries. Except for the fact that I did not record my specimens as being viscid, they also agree with the original diagnosis of *H. subviolaceus* Peck and with the description of this given by Smith & Hesler (*Lloydia*, **5** (1942), 17), who describe the cap 'with a subviscid separable pellicle' and the 'taste of the moist surface of the cap markedly bitter, that of the flesh bitterish-subnauseous'; however, in the observations they mention having received specimens which were not bitter at all. Unfortunately I did not note whether the cap had a separable pellicle or not nor did I taste the 'moist cap surface', describing it merely as 'slightly viscid'. However, since other characters agree well I am ignoring these slight differences and have included *H.* (C.) *subviolaceus* in the 'List' for the Devon collection, described thus:

Cap 17–36 mm., convex then expanded sometimes slightly umbonate, *violaceous-grey with centre darker vandyke or brown-violaceous, drying pale dirty brownish* and matt and opaque from centre out then entirely pale grey with slight violaceous-brown tinge, striate at margin and slightly viscid when moist. *Gills* ± arcuate-decurrent, *slate-grey or slightly bluish grey, becoming whitish grey*, subdistant or subcrowded, L 20–26 l 1–3, sometimes veined at base or interveined, edge even. *Stem* 20–35/3–6 mm., equal with slightly pointed base to slightly swollen above base, *pale slate-grey or whitish-grey*, base with faint dirty brownish tinge when handled, silky-striate, stuffed then hollow, base not or slightly white tomentose. *Flesh* concolorous, drying paler in centre of cap and stem. *Smell* and *taste* none. *Spores* subglobose or broadly ovoid, 6–8/4½–6 μ, with large oblique apiculus. *Basidia* 4-spored, 44–52/6–8 μ. *Gill edge* fertile. Hyphae on cap 3–8 μ diam., filamentous occasionally branched, clamped.

In grass in wet field (near oak), Membury, Devon, 2 Nov. 1957. Best distinguished by violaceous-brown cap, pale stem without yellow tinge, gills at first slate or bluish grey and broad spores. *H. lacmus* is usually more robust as well as having the stem base distinctly yellow inside and out. I agree with Smith & Hesler (l.c. p. 18) that *H. colemannianus* s. Ricken is very likely the two-spored form of *H. subviolaceus*.

HYGROPHORUS (HYGROCYBE) *AURANTIOSPLENDENS* (Haller) P. D. Orton (see p. 176 and Figs. 66–68, 282)

In *Trans. Brit. mycol. Soc.* **38** (1955), 404, a description of this fungus was promised. This is based entirely on British material:

Cap 22–60(80) mm., conico-convex or conical, more rarely convex, then expanded ± plane, sometimes with small acute or obtuse umbo, *scarlet-red or orange-vermilion, discolouring orange then golden or chrome-yellow in places, red often persisting in patches*, finally pallid yellow, buff with orange tinge or grey-olive, viscid, shiny when dry, slightly striate at margin when moist. *Gills* narrowly adnate or almost free, *lemon or chrome-yellow with orange flush then pale or deep lemon*, sometimes retaining orange flush near cap flesh but *usually paler when old*, subcrowded, L 28–32 l 1–3, sometimes veined on sides in large specimens, edge concolorous or paler, even. *Stem* 30–95/6–15 mm., *robust*, often attenuated upwards or with clavate-bulbous base (10–18 mm. diam.), sometimes compressed or channelled especially near base (< 22 mm. diam.), lemon or chrome-yellow, sometimes with orange flush in places (especially near apex when young), minutely white silky-striate under lens, hollow, fragile. *Flesh* at first red or orange under cap cuticle, over gills and in upper part of stem, then lemon or chrome-yellow throughout, sometimes paler whitish-lemon in centre of stem. *Smell* and *taste* none. *Spores* cylindric-ellipsoid, *constricted in some views*, *7–9(10)/4–4½* μ (Fig. 282). *Basidia* 4-spored, *ca.* 48–56/7–8 μ. *Gill edge* fertile, no cystidia. Hyphae of cap surface filamentous, 1–4(6) μ diam., encrusted pigmented, clamped; below these are wider shorter-celled hyphae < 24 μ diam. with yellow vacuolar pigment.

In grass, Hackhurst Downs, Gomshall, Surrey, 18 Oct. 1953; Chatsworth, Derbyshire, 11 Sept. 1956; Membury, Devon, 5 Nov. 1956, and elsewhere. Not uncommon and widely spread. It is best recognized by constricted spores, bright colours (especially the tendency of the red and orange to fade with age) and robust stem. Differs from *H. quietus*, which has similar spores, in lack of smell when rubbed, gills with orange flush at first then fading (those of *H. quietus* acquire the orange flush as the cap expands) and more viscid cap with more pronounced red at first.

Hygrophorus (*Hygrocybe*) **coccineocrenatus** sp.nov. (Figs. 55–58, 283)

Pileus 10–30 mm., e convexo expanso ad discum depressus, coccineus vel miniatus, siccitate vel senectute aurantiacus vel luteolus, ad marginem vulgo persistentiore coccineus, jove pluvio non viscidus, saltem ad discum squamulis parvis pilosis brunneolis mox nigrescentibus obtectus, ad marginem diu involutus et crenatus. Lamellae longe decurrentes, arcuatae, ex albo albidae vel pallide luteolae, interdum ad basim obscuriore luteae vel aurantiaco-tinctae, subdistantes, L 13–20 l 1–3. Stipes 10–35/1–4 mm., aequalis interdum ad basim attenuatus vel flexuosus, coccineus, miniatus vel aurantiacus dein aurantiaco-luteus vel luteus, jove pluvio pingue glaber, jove sicco nitidus. Caro mediae partis stipitis pallide luteola, sub cuticula pilei stipitisque aurantiaca vel rufula, interdum ad basim stipitis obscuriore lutea. Odor nullus. Sporae ellipsoideae, 10–13(14)/6–8 μ (Fig. 283). Basidia 4-sporigera. Acies lamellarum fertilis.

In locis uliginosis vel humidis, Studland Bay, Dorset, 30 June 1953 (typus in Herb. Kew.), legit T. J. Wallace. A H. turundo s. Fr., F. H. Møller colore pilei coccineo sporis majoribus differt.

Cap 10–30 mm., convex then expanded with the centre depressed, *scarlet or vermilion*, drying or discolouring orange or yellowish, margin often more persistently red, not viscid when moist, *with small brownish erect fibrillose pilose scales at least at centre which soon turn darker brown or blacken*, margin incurved for a long time and often crenate. *Gills* deeply decurrent, arcuate, white then *whitish or pale yellow*, *sometimes deeper yellow or tinged orange* near flesh of cap, rather distant, L 13–20 l 1–3. *Stem* 10–35/1–4 mm., equal or sometimes attenuated at base or flexuose, scarlet, vermilion or orange-red discolouring orange-yellow or yellow, greasy-smooth when wet, shiny when dry. *Flesh* pale yellowish in centre of cap and stem, reddish or orange under cuticles, sometimes darker yellow in stem base. *Smell* none. *Spores* ellipsoid, *10–13(14)/6–8* μ (Fig. 283). *Basidia* 4-spored. *Gill edge* fertile.

In boggy hollows and wet places, especially under *Molinia* tussocks or in *Sphagnum*. Studland Bay, Dorset, 25 Nov. 1951, 23 July 1952, 30 June 1953 (type in Herb. Kew), 6 Oct. 1953 and subsequently (legit T. J. Wallace); Culbin Sands, Morayshire, 15 Sept. 1953 (legit T. J. Wallace). Differs from *H. turundus* s. Fr., F. H. Møller in scarlet or vermilion cap and larger spores. This is probably *H. miniatus* var. *sphagnophilus* Peck s. A. H. Smith & Hesler (*Lloydia*, **5** (1942), 29) but not the fungus Peck described with cap 'glabro'. It is also *Hygrocybe turunda* s. J. Lange and *Hygrophorus turundus* s. Kühn. & Romagn., but not *H. turundus* s. Fr. on account of the red cap, since the cap colour is described as slightly red only in Fries's 1838 description, the original description (1821) being 'luteus, vulgo aureus' altered to 'aureus l[eviter] coccineus' (1838) but changed back to 'aureus' (1874). These colours seem to agree better with those of *H. turundus* (p. 270) as described by Møller and my Scotland collection with distinctly smaller spores (see key, § 7, p. 249).

Hygrophorus (*Hygrocybe*) **conicoides** sp.nov. (Figs. 69–71, 287)

Pileus 13–40 mm., e conico conico-expansus, postremo fere planus et papillatus vel ± acute umbonatus, ad marginem interdum undulato-lobatus, coccineus vel cerasino-ruber, primo ad marginem anguste flavus, interdum siccitate lineato lutescens, praecipue ad discum lente nigricans, senectute aurantiaco-brunneus et niger, jove pluvio ad marginem striatus, jove sicco notabile radialiter sericeus. Lamellae liberae vel anguste adnatae, vulgo prope marginem pilei latissimae, e flavo aurantiaco-rubrae vel coccineae, ad marginem pallidiore coloratae, postremo totus rubrae, subconfertae, L 32–48 l (0) 1 (3), ad aciem persistentiore flavae sed vulnerato facile nigricantes, interdum jove pluvio guttatas rubras plorantes. Stipes 25–70/3–6 mm., aequalis, citrinus, flavus, aureus vel colore pilei tinctus, vulnerato facile nigricans, interdum ad basim leviter virido-citrinus vel albidus, sericeo-fibrilloso striatus, cavus. Caro pilei coccinea vel ruber, stipitis citrina, flava vel aurantiaca, facile nigricans, jove sicco intus luteola. Odor nullus. Sporae ellipsoideo-oblongae vel leviter phaseoliforme-cylindricae, ($9\frac{1}{2}$) 10–13/4–5 μ (Fig. 287). Basidia 4-sporigera, 36–42/9–10 μ. Acies lamellarum primo cellulis clavatis sterilibus dein fertilibus.

Inter graminos, praecipue juxta mare, Bossington, Somerset, 31 Oct. 1957 (typus in Herb. Kew.). A H. conico et H. nigrescente lamellis rubris, carne pilei rubra, sporis angustioribus differt.

Cap 13–40 mm., conical or conico-convex then expanded-conical, finally ± plane and papillate or acutely umbonate, sometimes with wavy-lobed margin, *scarlet-red or cherry-red at first with very narrow yellow marginal zone*, sometimes drying or discolouring to pinkish carmine and yellowish streaky, only slowly discolouring blackish and then usually at centre, when old often blackish and reddish orange-brown or burnt sienna mixed, striate at margin when moist, with marked radial silky sheen when dry. *Gills* free or narrowly adnate, sometimes remote, often broadest near margin, at first chrome-yellowish with paler margin *soon flushed rose, orange-red or scarlet-red from base*, often finally ± entirely *carmine- or cherry-red*, edge more persistently yellow readily blackening when bruised, subcrowded, L 32–48 l (0) 1 (3), edge sometimes with reddish drops in wet weather. *Stem* 25–70/3–6 mm., ± equal, lemon- to chrome- or golden-yellow or tinged cap colour, sometimes greenish lemon or whitish at base, readily blackening when handled, silky-fibrillose striate, hollow. *Flesh* scarlet to carmine-reddish in cap, lemon-yellow to orange in stem, drying paler or whitish in centre of cap and stem, readily blackening when bruised. *Smell* and *taste* none. *Spores* ellipsoid-oblong sometimes slightly phaseoliform-cylindric, *($9\frac{1}{2}$) 10–13/4–5* μ (Fig. 287). *Basidia* 4-spored, 36–42/9–10 μ. *Gill edge* sterile at first with clavate cells then fertile. Hyphae on cap 2–8 μ diam. branched, clamped, sometimes encrusted-pigmented, over wider hyphae up to 16 μ diam. with yellow vacuolar pigment.

In grass usually near the sea: Bossington, Som., 30 and 31 Oct. 1957 (type in Herb. Kew); semi-fixed dunes, Rock, Cornwall, 9 Nov. 1957; dune grassland, Holkham, Norfolk, 6 Oct. 1958 (legit E. A. Ellis). Readily distinguished from *H. conicus* and *H. nigrescens* by gills soon turning reddish, red flesh in cap, narrow spores and perhaps more persistently red cap colour. What may possibly be a 2-spored form of this fungus was gathered at Weeting Breck, Norfolk, on 2 Oct. 1958, but I wish to have more material to be certain of this.

Hygrophorus (*Hygrocybe*) **olivaceoniger** sp.nov. (Figs. 74–75, 288)

Pileus 28–38 mm., e conico-convexo expanso-conicus vulgo leviter papillatus, pallide viride eburneo-albidus dein sordide luteolo- vel olivaceo-viridulus, mox olivaceo-ochraceo tinctus, interdum ad discum obscuriore olivaceo-brunneus, hac atque illac (vulgo primo juxta marginem vel ad discum) nigricans dein fere totus obscure brunneo-niger, jove pluvio striatus, sub lente minute radialiter praecipue circa discum fibrillosus, interdum radialiter fissuratus. Lamellae liberae vel angustissime adnatae, ventricosae, e pallide luteolo-viridulo vel viridulo-eburneo acie albida albido-griseo-olivaceae vel sordide griseo-virides, primo ad marginem albae, ad aciem facile nigricantes, subconfertae, L 32–40 l 1 (3), ad aciem leviter inaequales. Stipes 32–58/5–6 mm., ± aequalis, albidus dein griseotinctus interdum ad apicem viridulo-eburneo tinctus, senectute vel vulnerato facile nigricans, albo-sericeo striatus, fragilis, cavus interdum albo-medullatus. Caro pallide grisea vel colore cornus tincta, interdum inter pileum olivaceobrunneo tincta, vulnerata nigricans. Odor nullus. Sporae cylindrico-oblongae interdum leviter strangulatae vel ad unum latus curvatae, 9–12½/4½–5½ μ (Fig. 288). Basidia 4-sporigera, 40–44/9–10 μ. Acies lamellarum sterilis, cellulae fusiforme clavatae vulgo ad apicem aliquantum acutae et longe pedunculatae, 36–62/8–16 μ.

Inter graminos muscosque, Holkham Gap Dunes, Holkham, Norfolk, 6 Oct. 1958 (legit E. A. Ellis); absentia exsiccatorum iconem et descriptionem in Herb. Kew., typum designo. Coloribus viridulis dein nigricantibus, sporis angustis facile distinguitur.

Cap 28–38 mm., conico-convex then expanded-conical often with slight papilla, *pale greenish ivory-whitish then dirty yellowish green or olive-greenish*, *soon tinged olive-ochraceous*, *sometimes darker olive-brown in centre*, *blackening in places* (usually near margin or at centre first), then almost entirely vandyke-blackish, striate when moist, minutely radially fibrillose under lens in places (especially round centre), sometimes splitting radially when old. *Gills* free or very narrowly adnate, ventricose, at first *pale yellow-greenish or greenish ivory with whitish margin then olive-grey-whitish or pale dirty grey-greenish*, subcrowded, L 32–40 l 1 (3), edge slightly uneven, readily blackening. *Stem* 32–58/5–6 mm., ± equal, *whitish then tinged grey*, *apex sometimes tinged greenish ivory*, *soon blackening* when handled or with age, white silky striate, fragile, hollow or sometimes with white pith. *Flesh* pale grey or tinged horn colour, sometimes tinged olive-brownish in cap, blackish when bruised. *Smell* none. *Spores* cylindric-oblong, sometimes slightly strangulated or curved on one side, *9–12½/4½–5½* μ (Fig. 288). *Basidia* 4-spored, 40–44/9–10 μ. *Gill edge* sterile, cells fusiform-clavate often with rather pointed apex and with long stalk, 36–62/8–16 μ.

In grass and moss, Holkham Gap Dunes, Holkham, Norfolk, 6 Oct. 1958 (legit E. A. Ellis); no material having been preserved I designate as type my painting, description and spore print now in Herb. Kew. Readily distinguished by greenish then blackish colours especially of gills and narrow spores.

HYGROPHORUS (HYGROCYBE) *SCHULZERI* Bres. *Fungi Tridentini*, 1, 57 (Figs. 392, 508–511)

Cap 15–28 mm., convex then expanded sometimes depressed or with wavy-lobed margin when old, *yellowish date-brown*, *vandyke or blackish-brown*, *often with paler margin*, drying dirty ochraceous or pallid buff from centre, margin sometimes remaining darker for some time, appearing smooth and not or only very slightly striate when moist, *minutely adpressedly silky-tomentose or velvety under lens* when dry, cuticle sometimes cracking in places when old. *Gills* adnato-decurrent, sometimes emarginate to shortly decurrent, ventricose or not, *whitish then tinged sepia or brownish near flesh of cap*, sometimes finally pale buff, subcrowded, L 30–34 l 1–3, often forked or veined on sides or interveined, edge even but sometimes rather thick and blunt. *Stem* 18–35/3–6 mm. (up to 10 mm. when compressed), equal or attenuated downwards, cap colour or paler, very slightly minutely pruinose at first but soon smooth and shiny, stuffed then hollow, rather tough. *Flesh* concolorous, drying whitish in centre of cap and stem, often persistently dark over gills and in rather horny cortex of stem. *Smell* and *taste none. Spores subglobose*, very minutely granular punctate (slightly wavy outline) sub immers., *3–4½/2½–3½ μ* (Fig. 392). *Basidia* 4-spored, about 30/4 *μ*. *Gill trama* regular (fide F.B.H.). *Gill edge* fertile. Hyphae on cap filamentous but end cells rather broad at tips and ± erect, 7–16 *μ* diam.; thus from above a scalp of the cap cuticle appears cellular.

In grass: Membury, Devon, 29 Oct. 1957, 2 Nov. 1957; Clapham, Yorks, 27 Aug. 1958. Readily distinguished by small spores, dull colours and no smell. Resembling *H. nitratus* in colour and habit but is a smaller rather tough little fungus, which seems best placed in subgen. HYGROCYBE next to *H. nitratus*, since the cap cuticle is not strictly cellular and the trama is of the type found in subgen. HYGROCYBE. It appears to be a grassland species in Britain, but although Bresadola gives the habitat as larch woods there can be no doubt that this is the same fungus; perhaps it grew in grass in the larch wood.

Hygrophorus (*Hygrocybe*) **splendidissimus** sp.nov. (Figs. 86–91, 285)

Pileus (20)30–110 mm., e convexo vel conico-convexo expansus, interdum leviter obtuse umbonatus, postremo leviter depressus, vulgo ad marginem undulato-labatus, coccineo-sanguineus vel splendide cerasino-ruber, primo ad marginem anguste vel angustissime aureo-flavus, senectute haud decolorans sed siccitate incarnato-opacus, aureo vel luteolo-ochraceo maculatus vel totus ochraceo-luteolus, jove pluvio leviter pinguis solum ad marginem striatus vel exstriatus, siccitate sericeo-nitidus. Lamellae vulgo anguste adnatae vel fere liberae, rariore latiore adnatae, ventricosae, e flavo-luteo mox aurantiacae dein coccineo-sanguineae, ad aciem persistentiore luteolae, subconfertae, L 24–50 l 1–3, interdum ad faciem venosae vel intervenosae. Stipes 30–90/5–23 mm. (a compressione < 30), vulgo ventricoso-fusiformis vel prope basim leviter incrassatus, rariore ± aequalis, vulgo compressus et canaliculatus vel contortus, coccineo-sanguineus vel aurantiacus et ad basim luteus vel totus ochraceo-luteus, glaber vel solum leviter sericeo-nitidus vel sericeo-fibrilloso striatus, farctus dein cavus, fragilis. Caro intus aureo-flava, juxta lamellas et sub cuticulam pilei stipitisque ruber vel aurantiaca. Odor et sapor nulli. Sporae ellipsoideo-ovoideae vel -oblongae, (7)7½–10/(4)4½–5½ *μ* (Fig. 285). Basidia 4-sporigera, 44–62/8–10 *μ*. Acies lamellarum fertilis. Hyphae cuticulae pilei 1–6 *μ* latae, hyalinae vel incrustato-pigmentatae, supra hyphas latiores 5–18 *μ* latae luteo-vacuolatas.

In campis, Membury, Devon, 29 Oct. 1957 (typus in Herb. Kew.). A H. coccineo lamellis angustiore adnatae, habitatione robustiore praecipue stipite ± ventricoso vulgo compresso, coloribus pilei minus facile decolorantibus, sporis diversiformibus differt. H. puniceus a stipite conspicue fibrilloso-striato, carne ad basim stipitis alba et coloribus mox decolorantibus differt. H. laetissimus Smith & Hesler (*Lloydia*, **5** (1942), 63, Pl. 12) a stipite albo vel albido differt.

Cap (20)30–110 mm., convex or conico-convex then expanded sometimes slightly obtusely umbonate, finally slightly depressed, often with wavy-lobed margin, *scarlet blood-red or bright cherry-red at first with narrow golden-yellow margin, scarcely discolouring with age*, but drying mixed pinkish opaque, reddish, golden-ochre or ochraceous-yellowish to almost entirely ochraceous-yellowish, when moist slightly greasy and striate at extreme margin only or not at all, when dry silky glossy. *Gills* adnate, usually narrowly so, to ± free, ± ventricose, *chrome-yellow soon orange then scarlet blood-red from base*, edge more persistently yellowish, subcrowded, L 24–50 l 1–3, sometimes veined on sides or interveined. *Stem* 30–90/5–23 mm.

(up to 30 mm. when compressed), usually ventricose-fusiform or slightly thickened near base, often compressed and channelled or contorted or twisted, more rarely ± equal, often attenuated at base, scarlet blood-red or orange with yellow base to almost entirely ochre-yellow, *smooth* or only slightly silky shiny or silky fibrillose-striate, stuffed then hollow, fragile. *Flesh golden-yellow in centre of cap and stem*, red or orange over gills and under cuticle of cap and stem. *Smell* and *taste* none. *Spores* ellipsoid-ovoid or -oblong, (7)7½–10/(4)4½–5½ μ (Fig. 285). *Basidia* 4-spored, 44–62/8–10 μ. *Gill edge* fertile. Hyphae of cap cuticle filamentous, 1–6 μ diam., hyaline or encrusted pigmented over broader hyphae 5–18 μ diam., with yellow vacuolar pigment.

In fields: Membury, Devon, 29 Oct. 1957 (type in Herb. Kew); Tomich, Inverness-shire, 28 Aug. 1957; Shaugh, Devon, 7 Nov. 1957. Differs from *H. coccineus* in more narrowly adnate to ± free gills, more robust habit (especially thicker often ventricose or compressed stem, Figs. 83–85, 86–91), differently shaped spores (Figs. 284, 285) and cap colours fading less readily. *H. puniceus* differs in having the stem conspicuously fibrillose-striate, flesh white at the base of the stem and cap colours fading more readily. Cke 912 (922) *puniceus* very probably represents *H. splendidissimus*. *H. laetissimus* Smith & Hesler (*Lloydia*, **5** (1942), 63, Pl. 12) is also robust and has a brilliant red cap but differs in having the stem 'white, the base splashed with scarlet or yellow'.

Hygrophorus (*Hygrocybe*) **strangulatus** sp.nov. (Figs. 76–80, 296)

Pileus 5–35 mm., e convexo expansus, interdum leviter obtuse umbonatus vel senectute depressus ad marginem leviter undulato-lobatus, coccineus vel miniatus ad marginem angustissime clare flavus, siccitate aurantius vel luteolo-ochraceus, jove pluvio solum ad marginem striatus, jove sicco praecipue ad discum minute aureo-furfuraceas, interdum juventute circa discum minute squamoso-furfuraceus. Lamellae stipiti variabiliter affixae, aut anguste vel late adnatae aut decurrentes, vulgo ventricosae, rariore arcuatae, pallide luteolae dein obscuriore flavae, vulgo aurantiotinctae vel totus aurantio-rubrae vel miniatae, subdistantes, L 16–24 l 1–3, raro juxta stipitem furcatae. Stipes 18–48/1–4 mm. (a compressione < 6), deorsum attenuatus vel aequalis, vulgo flexuosus, interdum compressus, coccineus vel miniato-aurantiacus vulgo ad basim flavus, haud raro totus flavus et hac atque illac aurantiotinctus, siccitate lutescens, jove pluvio pingue lucidus vel haud viscidus, jove sicco glaber vel leviter sericeo-striatus. Caro concolor siccitate mox intus flavescens, aliquantum lenta. Odor et sapor nulli. Sporae ellipsoideo-oblongae, haud raro strangulatae, 7–9/4–5 μ (Fig. 296). Basidia 4-sporigera, 45–52/7–8 μ. Acies lamellarum fertilis. Hyphae cuticulae pilei 6–16 μ latae, interdum flavovacuolatae, supra eas hyphis angustissimis 1–2 μ latis tenue obtectae.

Gregarius vel caespitosus; typice ad terram arenosam praecipue in ericetis, interdum in campis. Witley Common, Surrey, 5 Nov. 1958 (typus in Herb. Kew.). A H. marchii sporae interdum strangulatae, pileo siccitate minute aureo-furfuraceo (non sericeo-nitido) differt.

Cap 5–35 mm., convex then expanded, sometimes slightly broadly umbonate or when old depressed with slightly wavy-lobed margin, *scarlet or vermilion with extreme edge bright yellow*, drying orange or yellowish ochraceous, when moist striate at margin only and slightly greasy-viscid, *when dry minutely golden-scurfy* especially at centre, sometimes minutely reflexed scurfy-scaly round centre when young. Gills from narrowly or broadly adnate to shortly decurrent, often ventricose, rarely arcuate, pale yellowish then *deeper chrome-yellow often flushed orange to entirely orange-reddish or vermilion*, subdistant, L 16–24 l 1–3, occasionally forked near stem. *Stem* 18–48/1–4 mm. (< 6 mm. when compressed), attenuated downwards or equal, often flexuose, sometimes compressed, scarlet or vermilion-orange, usually with chrome-yellow base or entirely chrome-yellow tinged orange in places, drying yellower like cap, greasy-shiny and *barely viscid when wet*, smooth or slightly silky-striate when dry. *Flesh* concolorous, soon drying yellowish in centre of cap and stem. *Smell* and *taste* none. *Spores* ellipsoid-oblong, *constricted in some views*, with rather large oblique apiculus 7–9/4–5 μ (Fig. 296). *Basidia* 4-spored, 45–52/7–8 μ. *Gill edge* fertile. Hyphae of cap cuticle 6–16 μ diam., some with yellow vacuolar pigment, with a thin layer of very narrow hyphae 1–2 μ diam. over these.

Gregarious or caespitose; especially common on sandy soil on heaths (often under bracken or heather) or on sand-dunes, but also in grass fields. Studland, Dorset, 29 Oct. 1956; Dawlish Warren, Devon, 12 Nov. 1956 (legit T. J. Wallace) and 24 Nov. 1956; Membury, Devon (in field), 25 Oct. 1957; Buxton Heath, Norfolk and Holt Lowes, Norfolk, 5 Oct. 1958; Witley Common, Surrey, 5 Nov. 1958 (type in Herb. Kew). Differs from *H. marchii* in constricted spores, cap minutely golden-scurfy when dry, is very hygrophanous and rather tough. *H. marchii*, *H. strangulatus* and *H. substrangulatus* are all predominantly dry red fungi, but the last has larger spores (9–12/5–7 μ) than the other two (6½–9/4–5 μ).

Hygrophorus (*Hygrocybe*) **subglobisporus** sp.nov. (Figs. 94–96, 295)

Pileus 35–70 mm., e conico expanso-conicus, interdum ad marginem undulato-lobatus vel postremo revolutus ± acute umbonatus (interdum forma H. calyptraeformis similis) (Fig. 95), aureus vel flavus, hac atque illac (praecipue juxta marginem) aurantiotinctus, jove pluvio viscidus et leviter striatus, jove sicco sericeo-nitidus. Lamellae liberae vel anguste adnatae, ± ventricosae, pallidissime citrinae margine albido dein pallide citrinae (semper pallide) sed juxta carnem pilei leviter obscuriore citrinae, subdistantes vel subconfertae, L 34–44 l 1–3, ad aciem aequales vel inaequales. Stipes 70–90/7–12 mm., aequalis vel sursum attenuatus, aureus vel flavus, interdum aurantio- vel aurantio-coccineo lineatus, pallidiore citrinus supra basim albam, jove pluvio leviter pingue-viscidus mox siccus, sericeo-striatus, raro longitudinaliter jugatus, e farcto cavus, ad basim vulnerata tendentione griseo-brunneolo vel pallide nigro tardissime (12–24 horis) contundere. Caro intus alba, sub cuticula pilei et superae partis stipitis flava vel aurantio-tincta, interdum in pileo vel apice stipitis citrina. Odor nullus. Sporae subglobosae, late ovoideae vel pruniformes, 8–12/6–10 μ (basidia 4-sporigera) vel (9)10–12(13½)/7–9(11) μ (basidia (1–)2-sporigera) (Fig. 295). Basidia numero sterigmaticis variabile, (1–)2-, (1–)2–4-, (2–)4-sporigera. Acies lamellarum fertilis. Hyphae cuticulae pilei filamentosae 10–26 μ latae flavo-vacuolatae, supra eas hyphas angustiores 2–8 μ latas obtectae.

In campis vel in silvis: Mountain Wood, East Horsley, Surrey, 21 June 1953 (in silva decidua mixta); Ingleton, Yorks, 23 Sept. 1957 (in campo, legit W. G. Bramley); sub Taxu baccata Polesden Lacey, Surrey, 14 Oct. 1958 (typus in Herb. Kew); Mickleham Downs, Surrey, 18 Oct. 1958. A H. langei sporis latioribus, statura robustiore (praecipue stipitis), tendentione basis stipitis obscurare, a H. konradii lamellis pallide citrinis (non flavis), pileo acutiore umbonato, coloribis pilei stipitisque magis flavis differt.

Cap 35–70 mm., *conical then expanded-conical*, margin sometimes wavy-lobed or finally upturned, ± *acutely umbonate* (sometimes resembling *H. calyptraeformis* in shape), *chrome or golden-yellow tinged orange in places* (especially near margin), when moist viscid and slightly striate, silky-shiny when dry. *Gills* free or narrowly adnate, ± ventricose, *very pale lemon-yellow with whitish margin then pale lemon-yellow* (*always pale*) but sometimes deeper lemon near flesh of cap, subdistant or subcrowded, L 34–44 l 1–3, edge even or uneven. *Stem* 70–90/7–12 mm., equal or attenuated upwards, golden or chrome-yellow, sometimes streaked orange or orange-scarlet in places, paler and lemon-yellow above white base, slightly greasy-viscid when moist but soon dry, silky striate, occasionally longitudinally ridged, stuffed, soon hollow, *base with tendency to bruise very slowly* (12–24 hr.) *grey-brownish* or slightly blackish. *Flesh* white in centre of cap and stem, chrome-yellow or tinged orange under cuticle of cap and upper part of stem, sometimes lemon-yellow in cap or stem-apex. *Smell* none. *Spores subglobose, broadly ovoid or pruniform, 8–12/6–10* μ (basidia (2–)4-spored) or *(9)10–12(13½)/7–9(11)* μ (basidia (1–)2-spored) (Fig. 295). *Basidia* with *variable number of sterigmata*, sometimes (1–)2–4-spored on same gill, sometimes (1–)2- or (2–)4-spored. *Gill edge* fertile. Hyphae of cap cuticle filamentous 2–8 μ diam. over broader hyphae 10–26 μ diam. with yellow vacuolar pigment.

In fields and woods: Mountain Wood, East Horsley, 21 June 1953 (in clearing in mixed deciduous woods); Ingleton, 23 Sept. 1957 (in field, legit W. G. Bramley); also 28 Aug. 1958 in same field; under yews, Polesden Lacey, 18 Oct. 1958 (type in Herb. Kew); Mickleham Downs also under yews, 18 Oct. 1958. Differs from *H. langei* in broader spores, more robust habit and slight tendency to darken after handling, and from *H. konradii* in pale lemon-yellow not chrome-yellow gills, more acutely umbonate cap and yellower colours. I think this is *Hygrocybe amoena* forma *sylvatica* Haller & Métrod, although I could find no cystidia on the gill edge, and it may be *Hygrophorus persistens* Britz., but the descriptions of Lasch for *Agaricus amoenus* and of Britzelmayr for *H. persistens* are not precise enough for me to feel justified in using either epithet. *Hygrocybe amoena* forma *pratensis* Haller & Métrod with gills 'schwefelgelb' and spores 8–9/6–7 μ suggests a different fungus. The consistently pale gills and broad spores are diagnostic characters for my fungus, which I have so far collected only on basic soil. The woods in Surrey in which I collected it also produced a few other grassland species so these may be relict fungi in this case.

HYGROPHORUS (HYGROCYBE) *SUBMINUTULUS* (Murrill) P. D. Orton (see p. 176 and Figs. 97–101, 294)

Cap 5–22 mm., convex then expanded-plane or slightly depressed, sometimes obtusely umbonate at first, scarlet-red, sometimes with deep yellow margin, soon fading to orange or vermilion, drying pale dirty yellowish or orange-ochraceous but red colour sometimes persisting in places especially near margin, striate and *very viscid* when moist, opaque and slightly silky-shiny when dry. *Gills* adnato-decurrent or shortly decurrent, arcuate or slightly ventricose, whitish then pale lemon- or chrome-yellow, sometimes deeper yellow or with slight orange flush near flesh of cap, subdistant, L 12–20 l 1–3, edge even. *Stem* 14–35/1–2½ mm., equal or attenuated at base, often flexuose, usually scarlet-red at apex shading through orange to chrome- or lemon-yellow at base, sometimes entirely red or yellow except for *usually persistently red apex*, fading to orange-yellowish or more rarely lemon-greenish, *very viscid* when fresh, smooth, stuffed then hollow. *Flesh* concolorous drying yellowish in centre of cap and stem but nearly always persistently red at stem apex. *Smell* and *taste* none. *Spores* ellipsoid-oblong, *sometimes slightly constricted* in some views, *5–7(8)/2½–3½(4)* μ (Fig. 294). *Basidia* 4-spored, 30–38/5–6 μ. *Gill edge* fertile. Hyphae of cap cuticle filamentous, sometimes branched, 1–6(7) μ diam., encrusted pigmented.

In grass, often gregarious. Chatsworth House, Derbyshire, 11 Sept. 1956; Membury, Devon, 3 and 4 Nov. 1956 and elsewhere; West Dean, Goodwood, Sussex, 18 Aug. 1943 (legit A. A. Pearson). This rather characteristic small *Hygrophorus* is readily recognizable by the stem apex being nearly always persistently red, very viscid fresh cap and stem and small spores. *H. insipidus* is less viscid and has very fugacious red colours as well as being rather larger. *H. reai* is less viscid, tastes immediately bitter and has rather broader more strongly constricted spores and deeper orange-red gills when mature. The diagnosis of Murrill agrees so well with my own description, especially the mention of persistent red colours, that I have no hesitation in using his name for it.

Hygrophorus (*Hygrocybe*) **substrangulatus** sp.nov. (Figs. 81, 82, 297)

Pileus 9–24 mm., e convexo expansus, interdum leviter umbonatus vel postremo depressus vel umbilicatus, coccineus interdum ad marginem miniatus vel luteolus, siccitate luteolo-ochraceo lineatus, senectute jove sicco pallide ochraceo-aurantiacus vel ochraceo-rubro maculatus, jove pluvio haud viscidus glaber et ad marginem striatus, jove sicco minute furfuraceo-lineatus vel sericeo-nitidus (juventute aureo-furfuraceus). Lamellae adnatae dente decurrentes vel decurrentes, ex albido vel pallide luteolo flavae mox aurantio- vel carmineo-rubro tinctae, subdistantes, L 14–32 l 1–3, ad aciem interdum persistente flavae, ± aequales. Stipes 10–18/2–4 mm., aequalis vel ad apicem vel ad basim leviter incrassatus, aut coccineus ad basim miniatus vel flavidus aut totus aurantiaco-luteolus, interdum senectute obscure aurantiaco-luteolus, siccus, glaber, ± nitidus, e farcto cavus. Caro intus pallide luteola, sub cuticula pilei coccinea vel aurantiaca interdum etiam ad apicem stipitis, sub cuticula stipitis aurantia vel flava. Odor nullus. Sporae ellipsoideo-ovoideae vel -oblongae, vulgo leviter strangulatae, 9–12/5–7 μ (Fig. 297). Basidia 4-sporigera, 44–62/8–10 μ. Acies lamellarum fertilis. Hyphae cuticulae pilei 6–16 μ latae, flavo-vacuolatae, supra eas hyphis paucis angustioribus 3–6 μ latis.

Ad terram arenosam, Studland, Dorset, 17 Nov. 1958 (typus in Herb. Kew.); l.c., 27 Oct. 1955 et 21 Nov. 1955 (legit T. J. Wallace); in campis, Clapham, Yorks, 27 Aug. 1958; in pratis Rothamsted Manor, Harpenden, Herts, 8 Nov. 1958. A H. marchii sporis majoribus, statura graciliore, pileo sicco furfuraceo-lineato (non aureo-sericeo nitido), a H. strangulato sporis majoribus, pileo sicco non furfuraceo-squamuloso differt. H. miniatus aliquantum similis est, sed a pileo distincte squamuloso, sporis minoribus differt.

Cap 9–24 mm., convex then expanded, sometimes slightly umbonate or becoming umbilicate or depressed, *scarlet-red*, *sometimes with yellowish or vermilion margin*, drying yellowish and ochre streaky from centre, rather dull ochraceous-orange or mixed ochre and reddish when old and dry, when wet smooth and scarcely viscid and striate at margin, *when dry minutely scurfy-streaky or with silky sheen*, golden-scurfy when young. *Gills* adnate with tooth or decurrent, whitish or pale yellowish *soon deeper yellow and with orange or carmine flush from base out*, subdistant, L 14–32 l 1–3, edge sometimes persistently yellow ± even. *Stem* 10–18/2–4 mm., equal or slightly thickened at base or apex, scarlet-red with vermilion or yellowish base to entirely orange-yellowish, sometimes dull ochraceous-orange when old, dry, smooth and ± shiny, stuffed then hollow. *Flesh* pale yellowish in centre of cap and stem, red under cap cuticle and sometimes in stem apex, orange or yellow in cuticle of stem. *Smell* none. *Spores* ellipsoid-ovoid or -oblong, *often slightly constricted* in some views, *9–12/5–7* μ (Fig. 297). *Basidia* 4-spored, 44–62/8–10 μ. *Gill edge* fertile. Hyphae of cap cuticle 6–16 μ diam. with yellow vacuolar pigment, with a few narrower hyphae 3–6 μ diam. over these.

In sandy soil, Studland, 17 Nov. 1958 (type in Herb. Kew) and 27 Oct. 1955 also 21 Nov. 1955 (legit T. J. Wallace); in grass, Clapham, 27 Aug. 1958 and Rothamsted Manor, Harpenden, 8 Nov. 1958. Differs from *H. marchii* and *H. strangulatus* in larger spores; *H. marchii* also differs in being usually more robust and the cap drying with golden-yellow silky sheen; *H. strangulatus* dries minutely scurfy-scaly; these are all dry rather conspicuous red fungi. *H. miniatus* has distinct concolorous scales on the cap as well as smaller spores.

HYGROPHORUS (HYGROCYBE) *TURUNDUS* (Fr. ex Fr.) Fr. (= *Agaricus turundus* Fr. ex Fr., *Syst. Mycol.* I, 106) (Figs. 59–61, 286)

I first collected this fungus in Scotland in 1955, but as I then regarded *turundus* to be as described by J. Lange with red cap and larger spores, I described the Scotch fungus in my notes under a provisional new name. When working out the 'New Check List', however, I discovered that the 1821 description of Fries gave the cap colour not as red but as 'luteus, vulgo aureus' or 'mox luteo' and that it was only in *Epicrisis* (1838) that he mentioned any red in the cap and then only that it was slight ('aureus l[eviter] cocinneus'), and the 'coccineus' was omitted in later descriptions. These colours agree better with those of my fungus from Scotland and I have therefore included this in the 'List' as *turundus* and have described the redder fungus with larger spores as a new species (*H. coccineocrenatus*, p. 262). Both have dark brown or blackish scales on the cap. Here is a description of *turundus* from my material:

Cap 12–30 mm., convex then convex-expanded, often umbilicate, sometimes deeply so, *orange-yellow*, *usually deeper orange at centre and more yellowish at margin*, the orange sometimes persisting in radial bands as the fungus dries, covered with *darker sepia rather erect ± pointed scales*, which are more numerous and more dense at the centre and fewer and more scattered towards the margin where they may be absent, margin exceeding gills and *lacerate-dentate*. *Gills* decurrent, sometimes rather deeply so, slightly ventricose near stem or not, whitish then pale yellow, rather thick, subdistant, L 16–20 l 1–3, edge blunt and even. *Stem* 17–40/2–6 mm., equal often with thickened apex or slightly thickened at base, sometimes flexuose, deep yellow often orange-yellow in places, often paler towards base, apex pruinose under lens, stuffed, base whitish or yellowish tomentose. *Flesh* yellow, paler when dry. *Smell* none. *Spores* $8\frac{1}{2}$*–11 (12)/*$4\frac{1}{2}$*–*$5\frac{1}{2}$ μ, oblong-ellipsoid, or slightly phaseoliform or curved or constricted in some views (Fig. 286). *Basidia* 4-spored. *Gill edge* fertile.

In damp moss or mossy soil. Under birch and pine, by River Luineag, Rothiemurchus, Inverness-shire, 28 Aug. 1955; in field in mossy grass, Tomich, Inverness-shire, 28 Aug. 1957. Differs from *coccineocrenatus* in lack of marked red colours in fresh cap and stem, cap margin lacerate-dentate rather than regularly crenate (but I think either could have been described as 'crenatus' by Fries as in the original diagnosis of *turundus*), and smaller differently shaped spores. This is also *turundus* as described and painted by Møller (FF, 155, Pl. 1^{b}) but I do not agree with Møller that J. Lange's *turundus* is the same. The rather yellow colours of Møller's illustration are much more like my idea of *turundus* than *coccineocrenatus*. It remains to be seen if this is a northern fungus, which might account for its not being familiar to some continental authors.

Hygrophorus (*Hygrocybe*) **xanthochrous** sp.nov. (Figs. 102–103, 289)

Pileus 10–25 mm., e convexo expansus leviter convexus, umbilicatus, ochraceo-flavus ad discum fuscotinctus dein flavus praecipue ad discum interdum usque ad marginem griseo-violaceo vel pallide lilacino maculatus, jove pluvio viscidissimus et striatus, ad marginem vulgo pallidiore coloratus crenatusque. Lamellae arcuato-decurrentes, pallide lilacinae interdum juxta carnem pilei flavotinctae, subdistantes, L 16–18 l 1–3, ad aciem aequales. Stipes 35–60/1–2 mm., ± aequalis, vulgo flexuosus, hyalinus sed supra pallide lilacinus infra albidus vel pallide flavidus, viscosissimus, glaber, fragilis, farctus vel ad apicem stipitis leviter cavus. Caro pilei flava vel ochraceo-flava, stipitis hyalino-lilacina vel albida interdum ad basim flavida. Odor et sapor nulli. Sporae ellipsoideo-amygdaliformes, 6–8/3½–4½ μ (Fig. 289). Basidia 2–(3)–4-sporigera, ca. 36–40/7–8 μ. Acies lamellarum fertilis. Hyphae cuticulae pilei filamentosae, hyalinae, 2–5 μ diam.

Inter muscos in ericetis, Nature Reserve, Rothiemurchus, 16 Sept. 1957 (legit D. M. Henderson et R. Watling; typus in Herb. Kew.). Fungus nobilis, delicatus, H. laeto similis sed a coloribus distinctissimus.

Cap 10–25 mm., convex, soon expanded, slightly convex, umbilicate, ochraceous-chrome-yellow, with centre tinged sepia then *mixed chrome-yellow and grey-violaceous or pale lilac*, latter colour confined to centre or extending to margin in places, *very viscid* and striate when moist, margin paler and crenate. *Gills* arcuate-decurrent, *pale lilac*, sometimes with yellow flush near flesh of cap, subdistant, L 16–18 l 1–3, edge even. *Stem* 35–60/1–2 mm., ± equal, often flexuose, hyaline but *pale lilac above and whitish or pale yellowish below*, *very viscid*, smooth, fragile, stuffed or slightly hollow at apex. *Flesh* yellow or ochraceous-chrome in cap, hyaline lilac or whitish in stem, sometimes yellowish at base. *Smell* and *taste* none. *Spores ellipsoid-amygdaliform*, 6–8/3½–4½ μ (Fig. 289). *Basidia* 2–(3)–4-spored on same gill, *ca.* 36–40/7–8 μ. *Gill edge* fertile. Hyphae of cap cuticle 2–5 μ diam., filamentous, hyaline, interwoven.

In moss under heather, gregarious in some quantity, Nature Reserve, Rothiemurchus, Inverness-shire, 16 Sept. 1957 (legit D. M. Henderson and R. Watling; type in Herb. Kew). A delicate and very distinct fungus, in some ways resembling *H. laetus* but with characteristic colours.

HYPHOLOMA EPIXANTHUM (Fr.) Quél. s. Fr. (?), Bresadola non Ricken

This name was removed from the British list by Pearson & Dennis (1948) on the ground that it was 'probably a form of *H. capnoides* sec Seth Lundell' and that 'the British records usually refer to young specimens of *H. fasciculare*'. The interpretation of Ricken, corresponding to *H. radicosum* J. Lange, which was included in the 1948 list, was not accepted since this can hardly be *epixanthum* s. Fries because there is nowhere in Fries's descriptions any mention of a rooting-stem. I have several times collected a caespitose *Hypholoma* in recent years which did not agree with any of those left in the 1948 list but which did agree with *H. epixanthum* s. Bresadola. This certainly has colours similar to *H. capnoides* but differs in not having a mild taste, in having a rather copious silky veil on the cap margin and in not growing on coniferous wood. Since it is possible that this is *Agaricus epixanthus* Fr., *H. epixanthum* is reinstated in the British list in the sense of Bresadola for the present. The silky veil on the cap margin (corresponding to 'pileo sericello demum glabro' (*Epicrisis*, p. 222) in the diagnosis of Fries) and the pale clay or clay-olive gills are the distinguishing features, but I did not see the gills 'albido-flavis' as given by Fries, although 'demum cinerascentibus' is in agreement, and the cap colour seemed to be rather darker ('colore pallido flavo, pilei disco saepe obscuriori'—*Epicrisis*). It may therefore prove to be a new species. Here is a description of British material:

Cap 17–54 mm., convex then expanded, sometimes slightly umbonate or when older slightly depressed at centre or with wavy-lobed margin, *bright tawny-brick, tawny-honey or tawny-ochre with paler more yellowish margin*, sometimes with darker pallid-honey or slightly olivaceous marginal zone when old, *white silky veil forming often concentric rather filmy-silky scales which persist near margin*, centre soon smooth, margin lacerate-fringed from or with appendiculate veil at first. *Gills* adnate emarginate often with tooth, *whitish soon clay then clay-olivaceous* finally with slight violaceous tinge, crowded, L *ca.* 24–32 l 3–7, edge concolorous or slightly paler, even or slightly minutely flocculose. *Stem* 17–68/3–13 mm., equal or slightly thickened at apex or with clavate base, sometimes compressed, entirely white silky-fibrillose at first then pale yellowish or ochraceous above and tawny-ochraceous, sepia or date-brown below, at first with upward-pointing silky-fibrillose scales, then silky-fibrillose striate, apex white pruinose, veil forming sometimes fugacious ring-zone, stuffed then hollow. *Flesh* pale tawny-honey or ochraceous-honey in cap (paler when dry), deeper red-brown or rusty in stem cortex and often darker at base, pale buff or with slight tawny tinge in centre of stem. *Smell* none or faintly acid. *Taste* bitter or bitterish. *Spores* 7–8/4–4½ μ, ellipsoid. *Basidia* 4-spored. *Marginal cystidia* lageniform with obtuse apex or fusiform, 20–34/5–8(10) μ, apex 2–5 μ. *Facial cystidia* clavate sometimes with short point with yellow body in NH_4OH, 30–40/8–12 μ.

Caespitose on deciduous wood (sometimes on buried wood) or sawdust: Chatsworth, Derbyshire, 11 Sept. 1956 (legit A. J. Dodd); Crowcombe Park Gate, Som., 24 Oct. 1958; and elsewhere.

Hypholoma ericaeoides sp.nov. (Fig. 300)

Pileus 16–40 mm., e convexo expansus vulgo late umbonatus, sed interdum umbone parvo praeditus, e sulphureo mox umbrino-fulvus vel rufo-brunneus ad marginem sulphureus vel olivaceo-luteus, postremo fere totus rufo-umbrinus, siccitate luteolus ad discum fulvo-ochraceus et glaber, jove pluvio striatus leviter viscidus. Lamellae adnatae interdum emarginatae, e sulphureo olivaceo-luteae postremo purpureo-olivaceae vel -umbrinae, subconfertae, L 24–30 l 1–7, ad aciem albido-flocculosae. Stipes 55–90/2–5 mm., aequalis, interdum ad apicem vel ad basim leviter incrassatus, vulgo flexuosus, nitide albidus vel pallide luteolus dein praecipue infra brunnescens, ad apicem albido-pruinosus vulgo diu luteolus, infra interdum conspicue sericeo-striatus, cavus, ad basim albido-tomentosus. Caro albida vel pallide luteola dein infra sordide rufobrunneo tinctus, juxta lamellas colore cornus tincta. Odor debilis gratus. Sporae ellipsoideae poro germinativo, 9–12/6–7 μ (Fig. 300). Basidia 4-sporigera. Cystidia aciei lamellarum cylindrico-flexuosa vel lageniformia, raro subcapitato, 20 44/4–10 μ ad apicem 3–4 μ latae. Cystidia faciei lamellarum clavata vulgo mucronata, 'chrysocystidia'.

Ad terram humidam vel limosam, praecipue ad margines lacunarum in ericetis, Elstead, Surrey, 13 Oct. 1955 (typus in Herb. Kew.). A H. ericaeo sensu Fries, Ricken lamellis primo sulphureis, sporis minoribus, a H. elongata coloribus obscurioribus, sporis latioribus differt.

Cap 16–40 mm., convex then expanded, often broadly umbonate, but sometimes with small obtuse umbo, *sulphur-yellow soon date-brown-tawny or reddish brown with yellow or olive-yellow margin*, sometimes redder at centre, finally almost entirely reddish date-brown, drying yellowish with centre tawny-ochraceous, striate and slightly viscid when moist, smooth. *Gills* adnate sometimes emarginate, *sulphur-yellow then yellowish olive finally purplish olive* or pale purplish umber, subcrowded, L 24–30 l 1–7, edge whitish flocculose. *Stem* 55–90/2–5 mm., equal or with base or apex slightly swollen, often flexuose, shining whitish or pale yellowish then discoloured brownish especially below, apex whitish pruinose and often remaining yellowish, remainder ± silky-striate often conspicuously so, hollow, base white tomentose. *Flesh* whitish or pale yellowish then tinged dirty reddish brown in lower part of stem, often horny over gills. *Smell* faint, pleasant. *Spores* ellipsoid with germ pore, *9–12/6–7* μ (Fig. 300). *Basidia* 4-spored. *Marginal cystidia* cylindric-flexuose to lageniform, rarely subcapitate, 20–44/4–10 μ, apex 3–4 μ. *Facial cystidia* clavate often mucronate, 'chrysocystidia'.

In damp muddy places, especially round the edges of ponds on heaths. Elstead, 13 Oct. 1955 (type in Herb. Kew); Epsom Common, Surrey, 28 Sept. 1952; Downwood, Shobdon, Herefordshire, 24 Oct. 1959. This is *Geophila ericaea* s. Kühner & Romagnesi (1953); since Fries in his diagnosis of *Agaricus ericaeus* does not mention yellow colour for the gills (in *Syst. Mycol.* 1 'nigricantibus', in *Epicrisis* 'e pallido nigris') I prefer to take *H. ericaeum* s. Ricken with gills not yellow at any stage and larger spores (Fig. 301) to be that of Fries and to describe this yellow-gilled fungus with smaller spores (Fig. 300) as a new species. *Hypholoma subericaea* grows in similar habitats but has spores 10 μ or less in length (Fig. 302) and gills not yellow. *H. udum* has much larger and differently shaped fusiform spores (Fig. 304). *H. elongatum*, which grows in *Sphagnum* or more rarely other mosses or even on soil, has spores of rather similar size to *H. ericaeoides* but they are paler sub micr. without violaceous tinge though the spore-print is tinged violet; it also has yellow gills at first but is often paler. *H. polytrichi* is also found in moss but has spores less than 10 μ long and a more conspicuous veil.

INOCYBE (INOCYBE) *AGARDHII* (N. Lund) P. D. Orton (see p. 177)

This agaric has long been known to me from sand-dunes among *Salix repens*, especially at Freshfield, Lancs, but was described and recorded by Reid from a sand-pit under willows as *Flammula agardhii* (these *Trans.* **38** (1955), 394). The spore print is, however, deep snuff or cigar-brown, and in view of the fibrillose cap and thin-walled marginal cystidia combined with ellipsoid or phaseoliform spores and absence of facial cystidia I have transferred it to *Inocybe* subgen. Inocybe. It has similar spores and marginal cystidia to those of *I. dulcamara* (under which name I at first recorded it), but it is much more robust and has a well-marked cortinal ring or ring-zone and the cap is not distinctly scaly. It is illustrated by J. Lange as *F. agardhii* and also described and figured by Heim (1931) as *I. carpta.* I prefer not to use the epithet *carpta* since *Agaricus carptus* Scop. ex Fr., 1821, is rather ambiguous.

Cap 20–95 mm., convex then expanded often slightly depressed, less commonly umbonate, *pale ochre-buff or yellowish ochre* then deeper buff or snuff-brown, fibrillose (fibrils often matted together and forming radial streaks, but *not distinctly scaly*), margin with rather persistent cortinal remnants. *Gills* adnate with tooth to decurrent, whitish then *pale buff to olivaceous-buff, finally deep snuff or cigar-brown*, subcrowded, L 40–60 l 3(7), edge white or pale flocculose. *Stem* 15–60/3–11 mm., equal or attenuated downwards, colour of cap but usually paler, fibrillose-striate, *pale yellowish cortina forming rather persistent, usually conspicuous ring-zone or fibrillose-floccose ring* near apex, solid then hollow, base white tomentose. *Flesh* pale yellowish. *Smell* none or faint pleasant. *Spores ellipsoid or phaseoliform*, 8–10/4½–6 μ. *Basidia* 4-spored. *Marginal cystidia* pyriform, clavate or more rarely cylindrical, rarely subcapitate, thin-walled, 20–40/8–18 μ. *Facial cystidia* none.

In *Salix repens* on sand-dunes: Freshfield, Lancs, 4 Sept. 1951 and subsequently; Studland, Dorset, 9 Sept. 1954; also under willows inland. Recognized by fibrillose cap, buff or snuff-brown colours, well-marked cortinate ring-zone or ring when fresh and microscopical characters. *I.* (I.) *terrigena* differs mainly in amygdaliform spores and more distinctly scaly cap.

Inocybe (*Inocybe*) **devoniensis** T. J. Wallace *in litt.* sp.nov. (Figs. 109–111, 393, 418, 419)

Pileus 15–65 mm., e convexo vel conico expanso-convexus, leviter vel prominenter umbonatus, e griseo-argillaceo vel argillaceo-fuscidulo sordide ochraceus vel umbrinus, vulgo ad marginem pallidiore coloratus, interdum ad discum obscuriore coloratus, radialiter fibrillosus mox forte rimosus vel fissuratus sed ad umbonem persistente glaber, primo velo sordide ochraceo ad marginem appendiculato ad discum obtectus. Lamellae liberae vel anguste adnatae, ex albo vel albido argillaceo-ochraceae vel olivaceo-tinctae, postremo argillaceo-fuscae, confertae, ad aciem albido-flocculosae. Stipes 20–60/3–8 mm. (infra 6–12), aequalis bulbo terete haud marginato, albus vel albidus, senectute praecipue infra sordide ochraceo-tinctus sed ad bulbum persistentiore albidus, mox fibrilloso-striatus, ad apicem albo-pruinosus, solidus. Caro alba, interdum intus leviter brunneolo-tincta, juxta lamellas colore cornus tincta, ad discum pilei crassa, firma. Odor spermaticus. Sporae subcylindricae vel phaseoliforme-cylindricae, 11–19/6–7½ μ (Fig. 393). Cystidia aciei lamellarum (*a*) clavato-fusiformia vel leviter lageniformia, aliquantum crassotunicata, interdum cristata, 26–52/14–25 μ: (*b*) pyriformia vel vesiculosa, tenuitunicata, 17–30/10–25 μ (Fig. 418*a*). Cystidia faciei lamellarum fusiformia vel lageniformia crassotunicata, interdum cristata, 45–70/14–20 μ (Fig. 419*b*). Cystidia leviter longiore ad apicem stipitis similia adsunt.

In locis arenosis maritimis humidis in societate Salicis repentis, Braunton Burrows, Devon, 3 Oct. 1951 (typus in Herb. Kew.; legit T. J. Wallace). Ab I. serotina Peck sensu Peck, Heim pileo obscuriore colorato magis rimoso, statura graciliore, velo primo appendiculato, fortasse sporis latioribus differt. I. serotina sensu Pearson (1946) idem est.

Cap 15–65 mm., convex or conical then expanded-convex, slightly to prominently obtusely umbonate, *grey-clay or clay-brownish then pallid-ochraceous or date-brown*, usually paler at margin, sometimes vandyke at centre when old, radially fibrillose, soon strongly rimose or splitting radially but ± *persistently smooth at umbo, at first with pale buff appendiculate veil at margin* and on umbo. *Gills* free or narrowly adnate, white or whitish then clay-buff or with slight olivaceous tinge, finally snuff-brown, crowded, edge paler and whitish flocculose. *Stem* 20–60/3–8 mm. (6–12 mm. at base), equal with ± rounded scarcely marginate bulb, *white then whitish, when old tinged pallid-ochraceous especially below* but bulb rather persistently whitish, soon fibrillose-striate, apex white pruinose, solid. *Flesh* white, sometimes tinged slightly brownish in stem or cap centre, horny over gills, thick at cap centre, firm. *Smell* ± spermatic. *Spores* subcylindric or phaseoliform-cylindric, *11–19/6–7½ μ* (Fig. 393). *Marginal cystidia* clavate-fusiform or shortly lageniform, thick-walled sometimes crested, 26–52/14–25 μ, mixed with a few shorter thin-walled pyriform or vesiculose cells, 17–30/10–25 μ (Fig. 418*a*). *Facial cystidia* fusiform or lageniform thick-walled sometimes crested, 45–70/14–20 μ (Fig. 419*b*). Similar but slightly longer cystidia at stem apex.

In dune-slacks associated with *Salix repens*. Braunton Burrows, 14 Oct. 1945 (legit F. R. Elliston-Wright); 3 Oct. 1951 (type in Herb. Kew), 11 July 1952, 26 Aug. 1952 all legit T. J. Wallace; 19 Nov. 1955. This fungus was described by Pearson (these *Trans.* **29** (1946), 200) as *I. serotina* Peck, but it differs from this species (s. Peck, Heim) in the darker and much more strongly rimose cap, the veil, more slender habit and possibly also broader spores. *I. halophila* has the stem pinkish pruinose at first and the flesh greenish in the cap and pinkish in the stem and the cap not so strongly rimose. *I. lacera* has a darker and more strongly fibrillose stem and is often more slender.

Key to Inocybe (*Inocybe*) *species* (*with elongate cylindric spores*)

1. Stem soon sepia or vandyke, fairly to strongly fibrillose; cap always dark; inland species often associated with conifers in heathy or sandy woods; sometimes rather small, cap 10–40 mm. *lacera*
1. Stem white or whitish, sometimes discolouring brownish (ochraceous) with age, not strongly fibrillose; sand-dune species **2**
  2. Flesh yellowish or greenish in cap, pinkish in stem; stem at first sometimes pinkish pruinose; cap tomentose-fibrillose, not strongly rimose; slender *halophila*

2. Flesh white or tinged brownish in places, never greenish or pinkish; cap almost smooth to strongly fibrillose-rimose persistently smooth at centre; slender or robust **3**
3. Cap persistently whitish at centre, outer part becoming ochraceous-buff and radially fibrillose but not strongly rimose, without distinct veil; spores 12–16(20)/5–6(8) μ; often robust *serotina*
3. Cap soon date-brown or vandyke at least in centre, outer part usually soon strongly rimose-fibrillose, pale buff appendiculate veil present at margin at first also at umbo; spores 11–19/6–7½ μ; habit medium *devoniensis*

Inocybe (*Inocybe*) **obscuroides** sp.nov. (Figs. 305, 420)

Pileus 20–32 mm., e convexo expanso-convexus, obtuse interdum late umbonatus, pallide sordide ochraceus vel lignicoloratus, interdum ad externam partem violaceo-cyaneus, ad discum squamulis obscure brunneis ± concentricis erectis circa discum ad summam leviter revolutis obtectus, ad externam partem glaber dein radialiter fibrilloso-rimosus. Lamellae adnatae, ex argillaceo-violaceo argillaceo-ochraceae postremo argillaceo-cinnamomeae, subconfertae, L ca. 34–36 l 3, ad aciem pallidiore flocculosae. Stipes 35–65/4–8 mm., aequalis vel ad basim leviter incrassatus, supra obscure aliquantum persistente violaceo-cyaneus, infra pallide sordide ochraceus, ad apicem albo-pruinosus, infra fibrillis sparsis albidis brunnescentibus obtectus. Caro violaceo-cyanea mox in pileo et ad basim stipitis albida. Odor fortis spermaticus. Sporae ellipsoideo-amygdaliformes, 8–10/5–6 μ (Fig. 305). Cystidia aciei lamellarum (a) fusiformia vel lageniformia crassotunicata interdum cristata 60–80/11–14 μ: (b) pyriformia vel clavata tenuitunicata 24–50/12–28 μ. Cystidia faciei lamellarum elongato aliquantum anguste lageniformia vulgo cervice longa (16–30 μ), crassotunicata vulgo cristata, in NH_4OH luteotunicata, 60–88/9–16 μ ad apicem 5–7 μ lata (Fig. 420).

In silvis, Tarn House Plantation, Malham, Yorks, 31 Aug. 1958 (typus in Herb. Kew.). Ab I. obscura sensu Fries, Kühner, absentia squamularum brunnearum ad stipitem, statura robustiore, coloribus magis violaceo-cyaneis differt. I. griseolilacina proxime accedit, quae a pileo squamulis albidis magis regulariter obtecto, statura graciliore et coloribus violaceis minus obscuris differt. I. pusio et I. cincinnata fungi coloribus violaceis solum ad apicem stipitis sunt.

Cap 20–32 mm., convex then expanded-convex, obtusely umbonate, sometimes broadly so, pale dirty brownish or wood-colour, *sometimes violaceous-blue in outer part* in places, with ± concentric darker sepia or vandyke scales, those at centre ± pointed and erect, those round centre slightly revolute at tips only, outer part ± smooth then radially fibrillose-rimose. *Gills* adnate, *clay-violaceous then clay-buff*, finally snuff-brown, subcrowded, L *ca.* 34–36 l 3, edge paler flocculose. *Stem* 35–65/4–8 mm., equal or slightly thickened at base, *deep and rather persistently violaceous-blue above*, pale dirty buff or pale ochraceous below, apex or upper quarter white-pruinose, remainder with scattered whitish then brownish fibrils, solid. *Flesh violaceous-blue*, soon whitish in cap and base of stem. *Smell* strong, spermatic. *Spores* ellipsoid-amygdaliform, 8–10/5–6 μ (Fig. 305). *Marginal cystidia* fusiform or lageniform thick-walled, sometimes crested, 60–80/11–14 μ, mixed with some pyriform or clavate thin-walled cells 24–50/12–28 μ. *Facial cystidia* elongate and rather narrowly lageniform, mostly with long neck (16–30 μ long), thick-walled often crested, walls yellow in NH_4OH, 60–88/9–16 μ, apex 5–7 μ (Fig. 420).

In woods, Tarn House Plantation, Malham, 31 Aug. 1958 (type in Herb. Kew). Differs from *I. obscura* s. Fries, Kühner in lack of dark-brown scales on stem, more robust habit and more distinct and persistent violaceous-blue colours. *I. griseolilacina* is rather similar but the scales are more uniformly distributed over the whole cap and are whitish, it is usually more slender and the violaceous colour is paler; in *I. pusio* and *I. cincinnata* the colour is restricted to the stem apex. I think this is *I. obscura* s. Konrad & Maublanc (*Ic. Sel.* 97^2) though they do not describe scales at the centre of cap, but I have seen such a fungus in the past and suspect the scaliness of the cap to be variable. The best diagnostic features are the deep violaceous-blue in part of the cap and in the stem and flesh and the clay-violaceous young gills.

Inocybe (*Inocybe*) **xanthocephala** sp.nov. (Figs. 394, 421)

Pileus 20–57 mm., e convexo expansus, acute vel obtuse umbonatus, flavido-ochraceus ad discum magis ochraceo vel fulvo tinctus, juxta marginem magis flavus interdum splendide flavus, primo radialiter innato-fibrillosus et ad discum glaber, dein sericeo-rimosus vel radialiter fibrillosus. Lamellae liberae vel anguste adnatae, interdum ventricosae, e pallide argillaceo olivaceo-argillaceae vel praecipue juxta carnem pilei luteolo-olivaceae, confertae, L 40–54 l 1–3, ad aciem albo-flocculosae. Stipes 24–75/2½–5 mm., aequalis vel ad basim incrassatus, albidus dein sursum pallide vel obscure ochraceus vel sordide ferrugineus, ad apicem albo-pruinosus, infra albo-sericeo striatus et floccis sparsis albis obtectus, farctus. Caro pilei flavotincta, stipitis intus albida, ad corticem et juxta lamellas sordide ochracea. Odor nullus vel terreus (non spermaticus). Sporae ellipsoideo-phaseoliformes, 9–13(16)/5–6(6½) μ (Fig. 394). Basidia 2–(3)–4- vel 4-sporigera, 30–38/8–9 μ. Cellulae steriles aciei lamellarum clavatae, fusiforme-clavatae vel utriformae tenuitunicatae 36–70/8–18(20) μ (Fig. 421). Cystidia nulla.

In silvis, praecipue in locis humidis, Elstead, Surrey, 9 Oct. 1954 (typus in Herb. Kew.). I. fastigiata proxime accedit, sed a colore pilei magis flavo, stipite magis coloratis basidiis interdum 2–4-sporigeris differt.

Cap 20–57 mm., convex then expanded, acutely or obtusely umbonate, *yellowish-ochraceous with umbo deeper ochraceous or tinged tawny and outer part more yellow, sometimes bright yellow* (generally duller when old), innately radially fibrillose with smooth centre at first then silkily rimose or radially fibrillose in outer part. *Gills* free or narrowly adnate, ventricose or not, pale clay then olivaceous-clay or yellowish olive (especially near flesh of cap), crowded, L 40–54 l 1–3, edge white flocculose. *Stem* 24–75/2½–5 mm., equal or with slightly swollen base, *whitish then pale ochraceous or rusty pallid to deeper ochraceous from base up*, apex white pruinose, remainder white silky-striate with a few scattered whitish flocci in upper half, stuffed. *Flesh* tinged chrome-yellow in cap, whitish in centre of stem, pallid or horny-ochraceous over gills and in stem cortex. *Smell* none or slightly musty-earthy (not spermatic). *Spores ellipsoid-phaseoliform*, 9–13(16)/5–6(6½) μ (Fig. 394). *Basidia* 4– or 2–(3)–4-spored, 30–38/8–9 μ. *Gill edge* with numerous thin-walled clavate, fusiform-clavate or utriform cells 36–70/8–18(20) μ (Fig. 421). *Facial cystidia* absent.

In woods, especially in damp places: Elstead, 9 Oct. 1954 (type in Herb. Kew); Holwell Wood, Enmore, Som., 21 Nov. 1957; Ellerburn, Yorks, 13 Sept. 1959. One of the '*fastigiata*' group but well characterized by coloured stem, pronounced yellow cap and basidia sometimes 2–4-spored.

Inocybe (*Clypeus*) **dunensis** sp.nov. (Figs. 306, 422)

Pileus 25–75 mm., e convexo expansus vulgo late obtuse umbonatus, pallide vel sordide ochraceus vulgo ad marginem primo pallidiore coloratus, dein ad discum interdum rufobrunneo tinctus vel postremo fere totus rufobrunneus, ad discum ± glaber, ad externam partem mox radialiter fibrillosus vel leviter rimosus, interdum primo residuis veli pallide griseo-ochracei praecipue ad discum obtectus sed ad discum vulgo arena occultus. Lamellae liberae vel angustae adnatae, ex albido mox argillaceo-ochraceae vel olivaceo-argillaceae postremo argillaceo-cinnamomeae, subconfertae, L 40–60 l 1–3, ad aciem albo vel albido flocculosae. Stipes 35–80/4–10 (ad basim 7–20) mm., aequalis ad basim marginato vel rariore terete bulbosus, albus vel albidus dein sordide incarnato vel ochraceo tinctus, primo totus albo-pruinosus dein fibrilloso-striatus, ad basim vulgo mycelio arenaque conjuncto, solidus. Caro alba vel albida dein in stipite praecipue ad apicem sordide incarnato vel ochraceo tincta, ad discum pilei crassa. Odor fortis, spermaticus. Sporae ellipsoideo-oblongae vel leviter cuneiformes, indistincte nodulosae vel undulato-angulatae, 9–12½(14)/5½–7½(8) μ (Fig. 305). Basidia 4-sporigera. Cystidia aciei lamellarum fusiformia vel leviter late lageniformia vulgo crassotunicata cristataque 40–64/12–22 μ. Cystidia faciei lamellarum, ventricoso-fusiformia vel lageniformia cervice lata breve, crassotunicata, cristata, 54–72/16–22 μ (Fig. 422).

Ad terram humidam arenosam prope mare in societate Salicis, vulgatissima; Freshfield, Lancs, 9 July 1956 (typus in Herb. Kew.). Ab I. serotina sporis stipite interdum sordide incarnato-tincto differt. Ab I. decipiente Bres. sensu Bres. a habitatione, pileo non 'squamuloso diffracto, cinnamomeo-ochraceo', stipite primo totus albo-pruinosus distinguitur, sed I. decipiens sensu Heim idem est.

Cap 25–75 mm., convex then expanded usually broadly obtusely umbonate, *pale or dirty ochraceous often at first with paler margin*, then sometimes reddish brown at centre or almost entirely so when old, ± *smooth at centre* soon radially fibrillose or slightly rimose in outer part, sometimes with traces of pale greyish buff veil at first but centre usually hidden beneath a cap of sand. *Gills* free or narrowly adnate, whitish, soon clay-buff or olivaceous-clay finally snuff-brown, subcrowded, L 40–60 l 1–3, edge white or whitish flocculose. *Stem* 35–80/4–10 mm. (7–20 mm. at base), equal with *marginate* or more rarely rounded bulb, *white or whitish then discoloured dirty pinkish or brownish*, *entirely white pruinose when fresh* then silky fibrillose-striate, solid, base frequently with large mass of matted mycelium and sand grains. *Flesh* white or whitish then tinged slightly ochraceous, dirty pinkish or brownish in stem (especially in upper part), thick at cap centre. *Smell* strong spermatic. *Spores* ellipsoid-oblong or slightly wedge-shaped, *indistinctly nodulose or wavy-angular*, 9–12½(14)/5½–7½(8) μ (Fig. 306). *Basidia* 4-spored. *Marginal cystidia* fusiform or slightly broadly lageniform usually thick-walled and crested, 40–64/12–22 μ. *Facial cystidia* ventricose-fusiform or lageniform with short broad neck, thick-walled, crested, 54–72/16–22 μ (Fig. 422).

In dune-slacks usually near *Salix* spp., very common: Freshfield, 9 July 1956 (type in Herb. Kew) and previously; Bettyhill, Sutherland, 28 July 1954 (legit T. J. Wallace); Braunton Burrows, Devon, 6 Oct. 1956 (legit T. J. Wallace). Sometimes macroscopically resembling *I. serotina* with which it often grows, but readily distinguished by spores and stem often with pinkish tinge inside and out at least at apex. I do not think this is *I. decipiens* Bres. s. Bres. since, despite similar spores and apart from the special habitat, the cap in *I. dunensis* is never 'squamuloso diffracto' as shown by Bresadola for *I. decipiens*, the cap colour of which 'cinnamomeo-ochraceus' is hardly that of my species. Furthermore, its stem is entirely white pruinose when fresh, whereas *I. decipiens* seems to be pruinose at apex only and to have more distinct veil traces. In view of the special habitat and these differences I prefer to describe the sand-dune fungus as a new species. It is well figured by Heim as *I. decipiens*. We have no certain record of *I. decipiens* s. Bres. non Heim for Britain.

Inocybe (*Clypeus*) **glabrodisca** sp.nov. (Figs. 307, 423)

Pileus 20–40 mm., e convexo expansus planus vel depressus margine erecta, umbrinus ad marginem pallidiore coloratus, interdum ad discum fere niger, primo ± glaber dein ad marginem rimoso-fibrillosus carne pallidiore hac atque illac exposita, ad discum persistente glaber et jove pluvio fere pinguis. Lamellae anguste adnatae, ± ventricosae, ex albo albidae vel argillaceae dein argillaceo-olivaceae, postremo argillaceo-cinnamomeae, confertae, L 40–48 l 1–3, ad aciem sub lente flocculoso-denticulatae. Stipes 53–75/3–8 mm., aequalis vel leviter terete bulbosus, albidus dein pallide sordide ochraceus, solum ad apicem albopruinosus, infra albo-sericeo floccosus vel sparse et laxe fibrillosus. Caro pilei et ad basim stipitis alba vel albida, stipitis sordide ochraceotincta, juxta lamellas colore cornus tincta. Odor fortis, spermaticus. Sporae cuneiformes vel oblongae, obtuse verrucosae, 7½–10/5–6 μ (Fig. 307). Basidia 4-sporigera. Cystidia aciei lamellarum (a) lageniformia crassotunicata interdum cristata, 50–76/12–18 μ; (b) clavato-vesiculosa vel pyriformia tenuitunicata, 30–50/12–34 μ. Cystidia faciei lamellarum lageniformia crassotunicata interdum cristata, 60–82/12–18 μ (Fig. 423).

Inter Polytrichos in silvis, Tarn House Plantation, Malham, Yorks, 1 Sept. 1958 (typus in Herb. Kew.). I. oblectabile affinis, sed a coloribus nigro-fuscis pilei, sporis minoribus differt.

Cap 20–40 mm., convex then expanded, plane or depressed with upturned edge, *date-brown-umber with paler margin*, sometimes almost black at centre, ± *smooth at first* then rimose-fibrillose at margin and showing paler flesh in places, *centre remaining smooth and almost greasy when moist. Gills* narrowly adnate, ± ventricose, white then whitish or clay to clay-olivaceous, finally clay-snuff, crowded, L 40–48 l 1–3, edge flocculose-denticulate under lens. *Stem* 53–75/3–8 mm., equal or with slight immarginate bulb, *whitish then flushed pale dirty buff or ochraceous, white pruinose at apex only*, remainder white silky floccose or loosely scattered fibrillose. *Flesh* white or whitish in cap and stem base, tinged pale dirty buff or ochraceous in stem, slightly coloured under cap cuticle, horny over gills. *Smell* strong, spermatic. *Spores* wedge-shaped or oblong, rounded knobbly, *7½–10/5–6½* μ (Fig. 307). *Basidia* 4-spored. *Marginal cystidia* (*a*) lageniform thick-walled often crested, 50–76/12–18 μ; (*b*) clavate-vesiculose to pyriform thin-walled, 30–50/12–34 μ. *Facial cystidia* lageniform thick-walled crested or not, 60–82/12–18 μ (Fig. 423).

In *Polytrichum* under mixed trees, Tarn House Plantation East, Malham, 1 Sept. 1958 (type in Herb. Kew). One of the smooth-capped '*oblectabilis*' group readily distinguished by dark cap colour and relatively small spores.

Inocybe (*Clypeus*) **striatorimosa** sp.nov. (Fig. 395)

Pileus 70–100 mm., e convexo expansus, prominenter acute umbonatus, interdum ad marginem abrupte incurvatus, umbrinus ad discum fere niger ad marginem pallidiore coloratus, rimosus dein squamulis adpressis vel revolutis obtectus sed ad marginem fere glaber. Lamellae adnatae secedentae, albidae dein argillaceo-cinnamomeae, subdistantes, ad aciem inaequales et albo-flocculosae vel brunneo-maculatae. Stipes 60–80/10–20 mm., aequalis vel ad basim leviter incrassatus, umbrinus vel infra obscuriore coloratus, fibro-striatus dein squarroso-squamosus, e farcto cavus. Caro pilei alba, in corticem stipitis brunnea, intus pallidiore colorata. Odor nullus. Sporae oblongae vel cuneiformes, prominenter 5–6-nodulatae, 6½–8½/5–6 μ (Fig. 395). Cystidia aciei lamellarum fusiforme-ventricosa, crasso-tunicata interdum cristata, 60–80/14–18 μ. Cystidia faciei lamellarum sparsa similia.

Ad terram arenosam in silvis, Hindhead, Surrey, 23 Sept. 1942 (legit A. A. Pearson, typus in Herb. Kew.). Ab I. striata Bres. sensu Bres. sporis minoribus, statura molto robustiore, pileo squamoso differt. I. striata sensu Pearson idem est.

This is *I. striata* Bres. s. Pearson non Bres. as recorded and described by Pearson (these *Trans.* **29** (1946), 198). It differs quite distinctly from *I. striata* s. Bres. (a synonym of *I. acuta* Boud.) in the smaller spores, much more robust habit and scaly cap. Furthermore, *I. acuta* was recorded by Pearson as *Astrosporina umboninota* (Peck) Pearson (these *Trans.* **26** (1943), 46), following J. Lange and Heim who described it as *I. umboninota*, which is an indication that Pearson thought his *I. striata* different from *I. acuta*. (It is doubtful, however, if *I. acuta* is the same as *I. umboninota* s. Peck.) Therefore I think *I. striata* s. Pearson is well worth separating specifically from the less robust, smoother-capped and larger-spored, though equally dark-coloured *I. acuta*.

LACCARIA BICOLOR (R. Maire) P. D. Orton (see p. 177 and Fig. 308)

Nearly every season when I have been collecting agarics in Scotland in recent years I have found at least one or two collections agreeing with *L. laccata* var. *bicolor* as described by R. Maire. Since, however, it seems very constant in colouring and easily recognizable in the field I think it worthy of specific rank, as is *L. amethystea* (= *L. amethystina*) distinct from *L. laccata* (see 'List'). The violaceous colours are not so deep as in *L. amethystea*, from which it is also readily distinguished by the bicoloured stem and different colours of cap and gills and by the spores, some of which are broadly ellipsoid. *L. proxima* is deeper coloured and entirely lacks violaceous tints, but the subglobose or broadly ellipsoid spores are similar to those of *L. bicolor*; if the latter were maintained as a variety it should be of *L. proxima* and not of *L. laccata*, which like *L. amethystea* has all spores globose.

Cap 20–44 mm., convex then expanded often slightly depressed sometimes also with incurved margin, *ochraceous-rusty or with slight tawny tinge*, drying pinkish or ochraceous-buff, sometimes with slight pinkish lilac tinge in places especially near margin, minutely ± concentrically scurfy-scaly when wet or dry. *Gills* adnate or adnato-decurrent, *pale lilac violaceous then clay-lilac*, when old pallid with faint lilac tinge, subdistant, L 22–30 l 1–3, edge even or eroded, sometimes slightly paler. *Stem* 72–144/4–7½ mm., equal or thickened at base or apex, sometimes slightly bulbous, ochraceous-buff or pallid-rusty in upper part with *conspicuous blue- or lilac-violaceous tomentum covering lower* ⅓–½, strongly fibrillose-striate in upper part. *Flesh* pale reddish buff or whitish tinged pinkish ochraceous. *Spores subglobose or broadly ellipsoid*, 7–9/6–7½ μ, spiny-warty, spines *ca.* ½ μ long (Fig. 308). *Basidia* 4-spored, 8–12 μ diam. (*Gill edge* not observed.) Cells of hyphae of cap cuticle cylindric, sausage-shaped or clavate, clamped, 6–12 μ diam.

In grass by road, Loch Rannoch, Perthshire, 27 Aug. 1954; in birch and pine woods, Badger Falls, Tomich, 18 Sept. 1958 and Pollanbuidhe, Glen Affric, Inverness-shire, 20 Sept. 1958. I have so far found this only in Scotland and not below 900 ft. above sea-level.

LACCARIA STRIATULA (Peck) Peck and *L. TORTILIS* ([Bolt.] S. F. Gray) Cooke (Figs. 309, 310)

In recent years I have found two Laccarias with 2-spored basidia. One has larger spores and is included in the 'List' as *L. tortilis* (see below) and is widely known and figured under this name. Singer, however, uses the epithet *echinospora* (of a South American species) for it, since he thinks the Bolton plate (41 A) quoted for *tortilis* to be a small *L. laccata*. This will probably always be a matter of opinion but I prefer to follow older authors and retain the epithet *tortilis* for the characteristic agaric with larger spores (Fig. 310), since the plate seems to me authentic and Bolton's description mentions that the cap is 'undulated' and gives the habitat as 'under vegetation in much shade' which is correct for this species. In Rea (*British Basidiomycetae*) small spore measurements (8–10 μ) and cap 10–25 mm. are given for *tortilis* and he may have had something different in mind. Singer has also synonymized *L. nana* Massee with the larger-spored form. This is plainly incorrect since (1) Dennis (these *Trans.* **31** (1948), 196) found the spores of type material to be smaller (9–12 μ), and (2) neither the description nor the figure of Massee are in agreement with *L. tortilis*. I am not prepared to include *L. nana* in the 'List' at present, preferring to await collection of further material; as it was collected in Kew Gardens it may be an alien; also the words 'pileus. . . cinnamomeo-lividus, subexpallens margine primitus albo-farinosa' in the original description do not agree with either of these 2-spored *Laccaria* spp.

The other fungus is included in the 'List' as *L. striatula* (see below) since Peck's original description indicates wet or damp places as the habitat and stresses the striate cap, also the spore details given by Singer for type material (*Mycologia*, **35** (1943), 151) are in fair agreement, i.e. 'spores globose or subglobose, spinose, 10·5–12·5/9·5–11·5 μ, spines up to 1·6 μ high' (because Singer has elsewhere stated that his measurements of *Laccaria* spores include spines, those quoted here are also assumed to include spines), and basidia 2-spored. If *L. nana* should be found identical then it would become a synonym of *L. striatula*. The differences between the two species may be summarized thus:

L. tortilis	*L. striatula*
Spores, excluding spines, 11–14(16) μ, spines 1–2 μ long (Fig. 310)	*Spores*, excluding spines, 8–11(12)/8–10 (10½) μ, spines ½–1 μ long (Fig. 309)
Cap 5–20 mm., when moist rose-pink with paler margin and sometimes deeper brownish pink centre, drying ochraceous-pink, shape often irregular	*Cap* 9–25 mm., when moist carmine with slight brownish tinge or deep red-brown, drying dirty pinkish or pinkish ochraceous, usually regular convex-expanded umbilicate or more rarely slightly umbonate
Gills distant, sometimes irregular, often branching or interveined, L 8–14 l 0–3	*Gills* subdistant to subcrowded, usually regular L 13–26 l 0–3
Habitat in bare soil in shady places	Habitat in *Sphagnum* or in wet places (e.g. by streams)

L. STRIATULA (Peck) Peck

Cap 9–25 mm., convex then expanded-convex often umbilicate or slightly depressed more rarely slightly umbonate, *carmine with slight brownish tinge to deep red-brown* usually paler at margin (pinkish ochraceous), sometimes with slight ochraceous-tawny tinge in centre, drying pale dirty pinkish or with slight ochre tinge in centre, *smooth and striate* (*often to centre*) *when moist*, matt or slightly silky-flocculose especially at centre when dry. *Gills* adnate slightly emarginate to slightly decurrent, often ± plane but slightly ventricose, pale then deeper pink or carmine, sometimes with ochraceous tinge near edge of cap, whitish pruinose when dry, subdistant to subcrowded, L 13–26 l 0–3, edge even but rather thick and blunt. *Stem* 20–65/1½–3 mm., equal or slightly swollen at base, often flexuose when growing in *Sphagnum*, coloured like centre of cap or paler, sometimes paler pinkish ochraceous at base or apex and paler when dry, sparsely to rather strongly white silky-striate, stuffed or narrowly hollow, base white or whitish tomentose. *Flesh* concolorous, often ochraceous or pinkish-ochraceous in cortex of stem, drying whitish in centre of stem. *Smell* none or faint fungussy. *Spores 8–11(12)/8–10½ μ*, spines ½–1 μ long, globose or subglobose (Fig. 309). *Basidia 2-spored*, 36–46/8–11 μ. *Gill edge* fertile.

On soil by stream, Gannochy, Glenesk, Kincardineshire, 3 Sept. 1955; in *Sphagnum* and under *Carex*, Downwood, Shobdon, Herefordshire, 24 and 31 Oct. 1959.

Lepiota brunneocingulata sp.nov. (Figs. 104–106, 312, 426, 427)

Pileus 14–24 mm., e convexo expansus vel postremo leviter depressus, vulgo late obtuse umbonatus, rufobrunneus vel ferrugineo-cacainus, interdum ad discum obscure brunneus vel cacainus, primo totus minute tomentoso-squamulosus, ad discum aut fere glaber aut velutino-tomentosus, dein ad externam partem squamulis cacainis adpressis vel leviter revolutis carne albida exposita obtectus, ad marginem lamellas excedens et interdum excoriatus. Lamellae liberae, remotae, a stipite collario cartilagineo separatae, ventricosae, ex albo albidae vel leviter cremeae, confertae, ad aciem integrae vel sub lente minutissime albo-denticulatae. Stipes 15–27/1½–3 mm. (ad basim 4–6), sursum attenuatus ad basim incrassatus vel leviter bulbosus, albus dein supra annulum albido-flocculosus et infra annulum albidus vel cacaino-tinctus, subtiliter sericeo-striatus, e farcto anguste cavus; annulus membranaceus distinctus, magnus, < 8 mm. latus, infundibuliformis dein superus, supra albus leviter flocculosus infra interdum squamulis paucis eis pilei similibus obtectus, ad marginem interdum flocculoso-laceratus vel squamulosus. Caro alba, sub cuticula ad discum pilei et ad basim stipitis cacaino-tincta, juxta lamellas, in collario et in cortice stipitis colore cornus tincta. Odor nullus. Sporae ellipsoideae vel leviter amygdaliformes, 5–7½/3½–4 μ (Fig. 312), in liquore Melzerio rubrobrunneae. Basidia 4-sporigera. Cellulae steriles aciei lamellarum clavatae, ± acute fusiformes vel leviter utriformes, 20–52/7–14 μ (Fig. 426). Cystidia nulla. Cellulae ultimae hypharum squamularum pilei fusiforme-cylindricae vel ad apicem fere acutae, vulgo ad basim flexuosae, rufobrunneo vacuolatae interdum sparse obscure granulatae, 80–250+/7–20 μ (Fig. 427); cellulae inferae breviores, cylindricae vel leviter curvatae interdum ramosae, hyalinae vel incrustato-pigmentatae, 20–50/3–7 μ; cellulae clavatae inter eas nullae; hyphas fibulatas non vidi.

Ad terram, Kenley Bottom, Spaxton, Som., 29 Oct. 1958 (legit Mrs E. Marriage, typus in Herb. Kew.). Annulo distincto, coloribus rufobrunneis, characteribus cellularum squamularum pilei, sporis insignis.

Cap 14–24 mm., convex then expanded, broadly obtusely umbonate or slightly truncate, sometimes finally slightly depressed, *reddish brown or* *rusty-date, sometimes darker chocolate or vandyke at centre* at first, entirely minutely tomentose-scaly with the centre almost smooth or more densely velvety-tomentose, then with *scattered* adpressed or slightly pointed *rusty-date or chocolate scales* on whitish background in outer half, margin exceeding gills slightly, sometimes appearing excoriated. *Gills* free, remote, separated from stem by cartilaginous collar, ventricose, white then whitish or very slightly creamy, crowded, edge even or very minutely white denticulate under lens. *Stem* 15–27/1½–3 mm. (4–6 mm. at base), attenuated upwards from thickened or slightly bulbous base, white then whitish and slightly floccose above ring, white then whitish or tinged chocolate below ring, finely silky striate, stuffed then hollow; ring *well-developed* membranaceous, < 8 mm. diam., *funnel-shaped then pendulous*, *white* and slightly floccose above, at edge and on underside sometimes with a few reddish-brown scales as on cap, edge sometimes floccose-lacerate. *Flesh* fairly thick at centre of cap, white, tinged chocolate under cuticle of centre of cap and at stem-base, horny over gills, in collar and in stem cortex. *Smell* none. *Spores* ellipsoid or slightly amygdaliform, 5–7½/3½–4 μ (Fig. 312), red-brown in Melzer. *Basidia* 4-spored, *ca.* 20–24/5–6 μ. *Gill edge* with clavate, ± pointed fusiform or slightly utriform sterile cells, 20–52/7–14 μ (Fig. 426). *Facial cystidia* absent. End-cells of hyphae of cap scales fusiform-cylindric ± pointed at apex, often flexuose at base, 80–250 + /7–20 μ (Fig. 427) with red-brownish vacuolar pigment and sometimes also scattered dark granules rarely entirely filling cell, cell walls also coloured; below these are shorter cylindric or sausage-shaped sometimes irregular or branched cells *ca.* 20–50/3–7 μ, hyaline or encrusted pigmented. There are no short clavate cells between these and no clamps were seen.

In soil: Kenley Bottom (in hedgebank), Spaxton, Som., 29 Oct. 1958 (legit Mrs E. Marriage; type in Herb. Kew); Park End (in hedgebank), Som., 24 Nov. 1958; Bindon Landslip, Rousdon (under ash trees), Devon, 29 Nov. 1958. Readily recognized by large ring, colours, small spores and cap cuticle characters.

Lepiota konradii sp.nov.

Pileus 36–120 mm., e conico-convexo conico-expansus prominente mammiforme vel aliquantum acute umbonatus, fuscus vel obscure brunneus vulgo ad discum obscuriore coloratus, cute aliquantum crassa ad partem externam in maculis adpressis diffracta carne pallide cremea exposita, ad discum vulgo integra manente, ad marginem albidus vel pallide cremeus sine cuticula fusca. Lamellae liberae, remotae, a stipite collario cartilagineo separatae, cremeo-albidae interdum senectute brunnescentes, confertae, vulgo prope stipitem angustiores. Stipes 70–150/5–10 (ad basim 9–24) mm., clavato-bulbosus, interdum ad apicem attenuatus, albus vel colore pilei tinctus, interdum infra squamulis minutis ± concentricis obtectus, cavus; annulus infundibuliformis, integer, persistens, senectute mobilis, ad marginem squamulis fuscis eis pilei similibus obtectus. Caro alba. Odor gratus. Sporae ellipsoideo-ovoideae poro germinativo, 13–17/8–10 μ. Basidia 4-sporigera. Cellulae steriles aciei lamellarum ± clavatae, 30–45/12–15 μ.

Ad latera viarum vel in silvis: Kew Green, Surrey, 15 Nov. 1945 (legit R. W. G. Dennis, typus in Herb. Kew.). A L. mastoidea cuticula pilei squamulis latis fuscis diffracta differt. L. excoriata subsp. mastoidea sensu Konrad et Maublanc idem est.

Cap 36–120 mm., conico-convex then conico-expanded with prominent mammiform or rather acute umbo, *sepia or vandyke* often darker at centre, *cuticle splitting up into broad adpressed patches in outer part* showing paler cream flesh between, *umbo usually remaining smooth*, margin whitish or pale cream without darker cuticle. *Gills* free, remote, separated from stem by collar, creamy-whitish sometimes brownish when old, crowded, usually narrowed near stem. *Stem* 70–150/5–10 mm. (9–24 mm. at base), clavate-bulbous, sometimes attenuated at apex, white or tinged colour of cap, sometimes minutely ± concentrically scaly in lower part, hollow; ring funnel-shaped, entire, persistent, movable when old, edge with sepia scales as on cap. *Flesh* white. *Smell* pleasant. *Spores 13–17/8–10 μ*, ellipsoid-ovoid with germ-pore. *Basidia* 4-spored. *Gill edge* with sterile ± clavate cells, 30–45/12–15 μ.

At the edges of paths or roads or in woods: Kew Green, Richmond, Surrey, 15 Nov. 1945 (legit R. W. G. Dennis; type in Herb. Kew). This is *L. excoriata* subsp. *mastoidea* s. Konrad & Maublanc, but not *L. mastoidea* s. Fries, Kühner & Romagnesi; it was renamed *L. excoriata* var. *konradii* by Huijsman (*Meded. Ned. mycol. Ver.* **28** (1943), 18) and *Leucocoprinus maublancii* by Locquin (*Bull. Soc. linn. Lyon*, **14** (1945), 87) but in both cases without Latin diagnosis. It differs from *L. mastoidea* s. Fr., Kühn. & Romagn., which is almost entirely covered with scattered minute brownish scales, in that the cuticle of the cap cracks into broad adpressed dark brown scales with persistently smooth umbo, so that the cuticle appears as if drawn in towards the centre. It differs from *L. excoriata* in darker cap cuticle and larger spores.

Lepiota ochraceofulva sp.nov. (Figs. 112–114, 313, 428–430)

Pileus 33–55 mm., e convexo plano-umbonato convexo-expansus vel fere planus interdum leviter late umbonatus, pallide ochraceo-cremeus ad discum rufobrunneus, squamulis ferrugineo-umbrinis vel ochraceo-ferrugineis ad discum confertioribus obtectus, ad marginem lamellas excedens vulgo residuis veli appendiculati decoratus. Lamellae liberae, remotae, a stipite collario cartilagineo anguste separatae, pallide ochraceo-cremeae, confertae, ad aciem fere integrae. Stipes 52–70/6–9 mm. (ad basim 10–11), sursum attenuatus ad basim leviter clavato-bulbosus, e pallide albido-cremeo pallide luteolo-cremeus vel praecipue ad apicem ochraceo-cremeus, ad basim leviter luteolus tactu obscuriore ochraceascens, juventute vulnerato aliquantum cito ferruginascens, sericeo-fibrilloso striatus, primo a velo albo copioso annulo sericeo-floccoso mox collapso et infra maculis ± concentricis etiam squamulis paucis ferrugineis eis pilei similibus obtectus, e farcto cavus; mycelium album. Caro alba sub cuticulas pilei stipitisque ochraceotincta, ad basim stipitis leviter luteola. Odor aliquantum fortis, nauseato-dulcis, 'mellis fermenti'. Sporae ellipsoideae, 5½–7/3½–4½ μ (Fig. 313), in liquore Melzerio rubrobrunneae. Basidia 4-sporigera, 22–26/5–6 μ. Cellulae steriles aciei lamellarum cylindrico-fusiformia vel clavata 18–28/5–8 μ ad apicem 3–6 μ lata (Fig. 428). Cystidia nulla. Cellulae squamularum pilei clavatae vel elongato-clavatae ± erectae ca. 30–60/8–15 μ (Fig. 430), supra hymeniformes conspectae (Fig. 429); infra eas hyphae filamentosae fibulatae 4–10 μ latae adsunt.

Inter folia Fagi, Mousewood Farm Wood, Honingham, Norfolk, 8 Oct. 1958 (typus in Herb. Kew.). A coloribus et structura cuticulae pilei fungus distinctissimus est.

Cap 33–55 mm., convex truncate then expanded-convex to ± plane, sometimes slightly broadly umbonate, pale ochraceous-cream with centre darker reddish date-brown, covered with ± concentric *rusty-date-brown or ochraceous-rusty scales*, these more closely set at centre, those in outer part often arranged ± radially, margin exceeding gills and often with appendiculate remnants of veil. *Gills* free, remote, separated from stem by narrow cartilaginous collar, *pale ochraceous-cream*, crowded, slightly ventricose, edge almost even. *Stem* 52–70/6–9 mm. (10–11 mm. at base), attenuated upwards from slightly clavate-bulbous base, pale whitish cream soon pale yellowish cream or tinged ochraceous-cream especially at apex, when bruised discolouring rusty-ochre or tawny-rusty rather quickly (in a few seconds or almost immediately) if fresh, *base slightly yellowish soon discolouring darker ochraceous when handled*, silky-fibrillose striate, at first with copious whitish veil which leaves silky-floccose collapsing ring or irregular ring-zone and ± concentric bands below, to which are attached a few rusty scales like those on cap, stuffed then hollow, confluent with cap; mycelium white. *Flesh* white, tinged ochraceous under cap and stem cuticle, slightly yellowish at base of stem. *Smell* rather strong, *sickly-sweet*, of 'fermenting honey'. *Spores* ellipsoid, 5½–7/3½–4½ μ (Fig. 313), red-brown in Melzer's solution. *Basidia* 4-spored, 22–26/5–6 μ. *Gill edge* with sterile cylindric-fusiform or clavate cells, 18–28/5–8 μ, apex 3–6 μ (Fig. 428). *Cystidia* absent. Hyphae of cap scales of ± *erect*, *clavate to elongate-clavate cells ca.* 30–60/8–15 μ (Fig. 430), appearing hymeniform when seen from above (Fig. 429); below these are interwoven filamentous clamped hyphae 4–10 μ diam.

In deep beech leaves under hedge at edge of wood (mixed deciduous mostly beech), Mousewood Farm Wood, Honingham, Norfolk, 8 Oct. 1958 (type in Herb. Kew). Differs from all other similarly coloured species of *Lepiota* sect. Ovisporae known to me by palisade-like cells on cap similar to those on *L. cristata.* This is perhaps another candidate for *L. helveola* Bres., but I prefer to describe this very distinct agaric as a new species.

Lepiota rhodorhiza sp.nov.

Pileus 7–30 mm., e convexo expansus obtuse umbonatus, interdum circa umbonem leviter depressus, ad discum obscure brunneus vel fuscus, circa discum brunneo-squamulosus carne alba vel albida exposita, ad marginem interdum non squamulosus et apparente excoriatus primo e velo albo fimbriatus vel dentatus. Lamellae liberae, remotae, ventricosae, ex albo albidae vel cremeae, confertae, L 26–38 l 1–3, ad aciem primo minute albo-flocculosae vel denticulatae. Stipes 15–40/1–2 mm., aequalis vel ad basim leviter incrassatus, interdum flexuosus, pallide sordide brunneolus, ad basim vulgo obscuriore brunneolus, ad apicem pallidiore coloratus, in partem mediam e velo albo vel albido sericeo-fibrilloso floccosus, infra squamulis brunneis sparsis eis pilei similibus interdum concentricis obtectus, e farcto cavus, ad basim radiculis filiformibus rufobrunneis vel sordide incarnatis terminatus. Caro pilei alba vel ad discum leviter rufobrunneo tincta, juxta lamellas colore cornus tincta, stipitis pallide sordide brunneola. Pileus a stipite concretus sed textura dissimile non separabilis. Odor fortis odore L. cristatae similis. Sporae ellipsoideae, 5–6½/3–3½ μ, in liquore Melzerio rubrobrunneae. Basidia 4-sporigera, 22–26/5–6 μ. Cellulae steriles aciei lamellarum breviter lageniformes 18–30/6–12 μ ad apicem 3–5 μ latae. Cellulae ultimae hypharum squamularum pilei cylindricae ad apicem fere acutae ad basim vulgo flexuosae et tunicis fortiore coloratis, ca. 150–300+/6–10(14) μ, cellulis brevioribus clavatis ca. 30–50/10 μ intermixtae. Radiculae filiformes fasciculorum hypharum coloratarum ½–1 μ latarum.

Ad terram inter Nepetas et Urticas, Tuck's Plantation, Surlingham, Norfolk, 12 Oct. 1957 (typus in Herb. Kew.); inter folias deciduas Fagi, Mousewood Farm Wood, Honingham, Norfolk, 8 Oct. 1958. A L. setulosa maxime affinis, sed a radiculis filiformibus coloratis ad basim stipitis differt.

Cap 7–30 mm., convex then expanded obtusely umbonate, sometimes slightly depressed round umbo, *vandyke or sepia at centre*, *remainder with sepia* *scales on white or whitish background*, margin sometimes without scales and appearing excoriate, at first fringed or dentate from the white veil. *Gills* free, remote, ventricose, white then whitish or cream colour, crowded, L 26–38 l 1–3, edge at first minutely white flocculose or denticulate. *Stem* 15–40/1–2 mm., equal or slightly thickened at base sometimes flexuose, pale dirty brownish with paler apex, base often darker brownish, white or whitish silky fibrillose-floccose from veil near apex or in middle part, *with scattered sometimes concentric brown scales like those on cap on lower part* where they sometimes form a ring-zone, stuffed then hollow, with *radiating reddish brown or dirty flesh-coloured mycelial strands round base*. *Flesh* of cap white or faintly reddish brown in centre, slightly horny over gills, of stem pale dirty brownish. *Stem* confluent with cap but texture different, not separable. *Smell* strong, similar to that of *L. cristata*. *Spores* ellipsoid, 5–6½/3–3½ μ, red-brown in Melzer's solution. *Basidia* 4-spored, 22–26/5–6 μ. *Gill edge* with numerous short lageniform sterile cells, 18–30/6–12 μ, apex 3–5 μ. End cells of hyphae of scales of cap cylindric with rather pointed apex, at base often flexuose and with more strongly coloured walls, *ca.* 150–300+/6–10(14) μ, mixed with shorter clavate cells, *ca.* 30–50/10 μ. Reddish mycelial strands of bundles of coloured hyphae ½–1 μ diam.

On soil under *Nepeta* and *Urtica*, Tuck's Plantation, Surlingham, 12 Oct. 1957 (type in Herb. Kew); in dead beech leaves, Mousewood Farm Wood, Honingham, 8 Oct. 1958. Much resembling *L. setulosa* but differing mainly in reddish mycelial strands at base of stem. This is *L. setulosa* s. Kühner, 1936, non J. Lange, Kühn. & Romagn. It was renamed *L. setulosa* var. *rhodorhiza* by Romagnesi & Locquin in BSMF, **60** (1944), 38 and later raised to a species by Kühner & Romagnesi (1953); neither was given Latin diagnosis.

LEPIOTA ROSEA Rea, these *Trans.* **6** (1918), 61, Pl. 2, Fig. 1. (Figs. 115–117, 396, 424, 425)

I have retained this epithet for an agaric which when fresh has the cap and stem covered with rose or wine-coloured floccose-granular scales consisting for the most part of globose cells. There is no statement in the original diagnosis of Rea that *L. rosea* changes colour when touched; the flesh is given as 'whitish becoming reddish, especially in the stem' and the stem 'whitish becoming concolorous' and I believe this to imply change of colour due to age. My agaric has a coloured veil from the start and though the colour is more varied than that given by Rea for *L. rosea*, I think the two are the same. Rea's plate corresponds very convincingly to a painting of mine of a specimen gathered by me in wet weather from which most of the scales had been washed off. This agaric is clearly distinct from *L. hetieri* Boud. s. Boud., F. H. Møller non J. Lange collected by me in 1958 and which is entirely white or cream (including meal on cap) when fresh but changes to pinkish or reddish brown when handled. I think, therefore, that Locquin (*Bull. Soc. linn. Lyon*, **14** (1945), 95) is mistaken in using the epithet *rosea* for a Lepiota which is white or creamy at first and discolours red-brown on handling and definitely in error to use it for one with, he claims, non-globose cells in the meal on the cap, since in both the original description and the plate of Rea the cells are plainly globose. The same criticism applies to his statement that *L. hetieri* s. J. Lange is without globose cells, since J. Lange has described and drawn them globose.

This description of *L. rosea* is based on three collections from one locality in Yorks:

Cap 11–32 mm. (35 sec Rea), convex or conico-convex then expanded sometimes broadly obtusely umbonate, *at first rose, pinkish tan or pinkish purplish buff from the scales of the veil* then paler pinkish tan or dirty rose-red sometimes darker at centre, *entirely mealy-scaly at first, often soon smooth at centre* or when old entirely so, margin with appendiculate floccose veil and coloured mealy scales at first. *Gills* free, ventricose, white then whitish or cream, crowded, L 28–40 l 1–3, edge ± even. *Stem* 20–30/2–4 mm. (50–60/3–5 mm. sec. Rea), equal or slightly thickened at base, *pinkish tan, pinkish purple or wine-brown with white or whitish apex, fading to pallid-reddish or pinkish brown with age, at first floccose-granular scaly like cap* except at apex, *later becoming smooth* or silky-striate, apex silky-striate, stuffed, rather tough and with cartilaginous cortex, not separable from cap; veil forming fugacious ring-zone but no membranaceous ring. *Flesh* white or whitish in centre of cap and stem, pinkish tan under cap cuticle, pinkish tan or wine- or purplish brown in cortex of lower part of stem, often becoming darker at base with age. *Smell* none or faint pleasant, fruity. *Spores* ellipsoid or ellipsoid-oblong with oblique apiculus, 4½–6/2½–3¼ μ (Fig. 396), not changing colour in Melzer's solution. *Basidia* 4-spored, 20–24/4–6 μ. *Gill edge* fertile but with some clavate or slightly lageniform sterile cells, *ca.* 20–40/6–12 μ (Fig. 424). *Facial cystidia* absent. Cells of scales on cap and stem globose or pyriform, (14)18–56 μ diam. (Fig. 425).

On soil in mixed deciduous wood, Langcliffe Brow, Settle, Yorks, 17 Sept. 1953, 22 Sept. 1957 and 29 Aug. 1958.

Lepiota subalba sp.nov.

Pileus 10–35 mm., e convexo expansus interdum obtuse umbonatus, albus vel cremeus interdum ad discum sordide cremeus, squamulis floccosis adpressis aliquantum latis interdum ad apicem recurvatis obtectus, ad discum interdum fere glaber, ad marginem juventute velo albido appendiculato decoratus. Lamellae liberae, ± ventricosae, ex albo cremeo-albae, subconfertae, L 24–44 l 3, ad aciem juventute albo-flocculosae. Stipes (17)20–45(65)/1–3 mm., aequalis vel ad basim leviter incrassatus, albus, ad apicem fibrillis sparsis albo-sericeis, infra velo albido vel cremeo fibrilloso-floccoso obtectus, interdum incerte annuloso-zonatus, e farcto cavus, ad basim interdum radiculis filiformibus albis terminatus. Caro pilei et in media parte stipitis alba, in cortice stipitis et juxta lamellas colore cornus tincta, interdum infra in cortice luteolo-brunnea tincta. Odor fere fortis, L. cristata quasi similis. Sporae truncato-fusiformes calcare laterale ornatae, 7–9/3–4 μ, in liquore Melzerio rubrobrunneae. Basidia 4-sporigera. Cellulae steriles aciei lamellarum cylindricae, clavatae vel fusiformes, ad apicem leviter acutae 5–10 μ latae. Cellulae hypharum squamularum pilei fere cylindricae, elongatae, 4–16 μ latae.

Ad terram in silvis vel locis nemorosis, Norbury Park, Mickleham, Surrey, 13 Oct. 1950 (typus in Herb. Kew.). A L. tomentella squamulis pilei adpressis coloribus pallidioribus differt. Speciebus ceteris Lepiotarum stenosporarum a coloribus pallidis distinguitur. L. albosericea P. Henn. sensu J. Lange non P. Henn. idem est.

Cap 10–35 mm., convex then expanded, sometimes obtusely umbonate, *white or cream sometimes deeper cream or tinged slightly ochraceous at centre*, covered *with adpressed whitish floccose usually rather broad scales* which are sometimes recurved at the tips, sometimes almost smooth at centre, margin with appendiculate whitish veil when fresh. *Gills* free, ± ventricose, white then creamy white, subcrowded, L 24–44 l 3, edge white flocculose when fresh. *Stem* (17)20–45(65)/1–3 mm., equal or slightly swollen at base, white, apex with scattered white silky fibrils, *whitish or creamy fibrillose-floccose veil on lower part* sometimes forming vague ring-zone, stuffed then hollow, base sometimes with white mycelial strands. *Flesh* white in cap and stem centre, tinged horn colour over gills and in stem cortex, sometimes tinged buff in lower stem. *Smell* rather strong like *L. cristata*. *Spores projectile-shape with lateral spur*, 7–9/3–4 μ, reddish brown in Melzer's solution. *Basidia* 4-spored. Sterile cells on gill edge cylindrical, clavate or fusiform with slightly pointed apex, 5–10 μ diam. Cells of cap scales subcylindric, elongate, 4–16 μ diam.

On ground in woods and shady places, Norbury Park, Mickleham, 13 Oct. 1950 (type in Herb. Kew), 2 Oct. 1954, 7 Oct. 1957; Clapham Woods, Yorks, 21 Sept. 1957 (legit W. D. Hincks). Distinguished from other spurred-spored *Lepiota* spp. by pale colours of cap and stem (except *L. tomentella* which has numerous minute pointed pale brownish fibrillose scales on the cap). This is *L. albosericea* P. Henn. s. J. Lange non P. Hennings and was renamed *L. subalba* by Kühner in BSMF, **52** (1936), 233, but without Latin diagnosis.

Lepiota tenera sp.nov. (Figs. 107, 108, 314, 435, 436)

Pileus 18–25 mm., e convexo mox expansus vel leviter depressus, ad discum obscure ochraceus vel brunneus, ad externam partem albidus vel pallide ochraceus, squamulis ochraceis vel fulvo-ochraceis, ad marginem gradatim dispersis minutissimis adpressis fibrillosis, ad discum confertioribus leviter acutis obtectus, ad marginem tenuissimum vulgo plicato-striatus vel crenatus. Lamellae liberae, remotae, ± ventricosae ex albo vel albido cremeae, subconfertae, L 32–40 l 0–1(3), ad aciem minutissime denticulatae. Stipes 20–25/2–4 mm., aequalis vel ad basim leviter incrassatus, albus vel albidus dein praecipue supra pallide ochraceus, ad apicem leviter pruinosus et sericeo-striatus interdum jove pluvio guttas luteolas plorans, infra squamulis ochraceis minutis sparsis ad basim densissimis obtectus, e farcto cavus, interdum ad basim pilis paucis brevibus brunneis; annulus floccoso-membranaceus, interdum fugax, albus, ad marginem ochraceo- vel brunneo-squamulosus. Caro alba vel albida, ad basim stipitis leviter sordide ochracea, juxta lamellas colore cornus tincta. Odor nullus vel fere fortis, odori L. cristatae similis. Sporae ellipsoideae leviter amygdaliformes, 6–8/3½–4½ μ (Fig. 314), in liquore Melzerio rubrobrunneae. Basidia 4-sporigera, ca. 20–22/7–8 μ. Cellulae steriles aciei lamellarum clavatae vel leviter fusiformes, 32–52/(6)8–16 μ (Fig. 435). Cystidia non vidi. Cellulae hypharum squamularum pilei subcylindricae vel leviter curvatae, vulgo aliquantum breves, interdum ramosae, brunneo-vacuolatae, 20–90/6–12 μ (Fig. 436); cellulae squamularum stipitis similes; fibulas inter cellulas non vidi. Stipes a pileo siccitate separabilis. Fungus delicatus facile marcescens.

Inter Nepetas et Urticas in silvo, Tuck's Plantation, Surlingham, Norfolk, 18 Oct. 1957 (typus in Herb. Kew.). Statura delicatissima et cellulis squamularum pilei brevibus maxime distinctus.

Cap 18–25 mm., convex, soon expanded or slightly depressed, *deep ochre-buff to vandyke at disk*, whitish or pale ochraceous elsewhere *with ochraceous or tawny-ochraceous scales which are more scattered towards margin* where they may be absent, scales at centre dense and slightly pointed, those elsewhere adpressed, fibrillose, very small and irregularly dispersed, margin very thin often plicate-striate or slightly crenate. *Gills* free, remote, ± ventricose, white or whitish then cream colour, subcrowded, L 32–40 l 0–1(3), edge very minutely denticulate. *Stem* 20–25/2–4 mm., equal or with slightly thickened base, white or whitish then pale ochraceous especially above, apex slightly pruinose and white silky-striate, sometimes with yellowish drops when wet, minute scattered scales like those on cap on lower stem, most dense at base, stuffed then hollow, sometimes with a few short brownish hairs at base; *ring distinct when young, floccose-membranaceous sometimes fugacious*, white, sepia or ochre-buff, scaly at edge. *Flesh* white or whitish, horny over gills and in stem cortex, slightly dirty ochraceous at base of stem. Cap and stem apparently confluent but can be pulled ± cleanly apart when dry (like a ball-and-socket joint). *Smell* none or fairly strong of *L. cristata*. Whole fungus delicate and readily shrivelling. *Spores* ellipsoid slightly amygdaliform, 6–8/3½–4½ μ (Fig. 314), reddish brown in Melzer's solution. *Basidia* 4-spored, *ca.* 20–22/7–8 μ. *Gill edge* with sterile clavate, cylindric-clavate or slightly fusiform cells, 32–52/(6)8–16 μ (Fig. 435). No *facial cystidia* seen. Cells of scales on cap ± cylindric or slightly sausage-shaped, mostly rather short, sometimes branched, with brown vacuolar pigment, 20–90/6–12 μ (Fig. 436); in some cells the pigment appears as a darker intracellular body. Cells of scales on stem similar, short, not reaching 90 μ in length. No clamps seen.

Under ground-ivy and nettles, Tuck's Plantation, Surlingham, 14 and 18 Oct. 1957 (type in Herb. Kew). Readily distinguished by its very delicate nature, cap cuticle characters, small spores, small size and colours. Its systematic position I regard as worth further investigation. I found a specimen of another such delicate *Lepiota*, but with pale rose-red cap and differing in some other details, in a hedge-bank in Somerset in 1958, but further material is needed before I can decide whether a different species is involved. Diligent search may reveal a series of these delicate agarics.

Lepiota xanthophylla sp.nov.

Pileus 15–20 mm., e convexo expansus interdum late umbonatus vel postremo leviter depressus, citrinus, squamulis ochraceo-fulvis obtectus. Lamellae liberae, citrinae, confertae, ad aciem serrulatae. Stipes 20–40/1½–4 mm., aequalis, infra velo citrino tomentoso et squamulis ochraceo-fulvis eis pilei similibus obtectus dein fibrillosus, sine annulo distincto. Caro alba vel pallide sordide brunneola, tenuis. Sporae ellipsoideae, 6½–9/3½–5 μ. Cellulae steriles aciei lamellarum diversiformes, cylindricae, clavatae vel lageniformes.

Ad terram, Hacking Copse, Singleton, Sussex, 1 Oct. 1945 (legit A. A. Pearson, typus in Herb. Kew.). A coloribus citrinis praecipue lamellarum insignis. L. citrophylla (Berk. & Br.) Sacc. sensu Boudier, Rea, auct. Eur. idem est. Agaricus (Lepiota) citrophyllus Berk. & Br. fungus tropicalis incertus est.

Cap 15–20 mm., convex then expanded, sometimes broadly umbonate or finally slightly depressed, *lemon-yellow, covered with tawny-ochraceous scales. Gills* free, *lemon-yellow*, crowded, edge serrate. *Stem* 20–40/1½–4 mm., without distinct ring, equal, *lemon-yellow tomentose veil covering lower part* and with some tawny-ochraceous scales as on cap near base, later appearing fibrillose. *Flesh* white or dirty brownish, thin. *Spores* ellipsoid, 6½–9/3½–5 μ, reddish brown in Melzer's solution. Cells on gill edge cylindric, clavate or lageniform.

On the ground, Hacking Copse, Singleton, 1 Oct. 1945 (legit A. A.

Pearson; type in Herb. Kew). Readily distinguished by lemon-yellow colours especially of the gills.

This is *L. citrophylla* (Berk. & Br.) Sacc. s. Boudier, Rea, auct. Eur. but as the original name *Agaricus* (Lepiota) *citrophyllus* Berk. & Br. was created for tropical material, the original diagnosis of which probably includes more than one fungus, the epithet *citrophylla* is unsuitable. I have not collected this fungus neither have I been able to find a good detailed modern description, but it is recorded in the note-books of A. A. Pearson in Herb. Kew as '*L. citrophylla*' and I have used his material and notes to describe this characteristically coloured fungus as a new species.

LEPTONIA ANATINA (Lasch) Kummer (= *Agaricus anatinus* Lasch, *Linnaea*, **4** (1829), 540)

This often robust *Leptonia* is not well known and is redescribed below (Figs. 118–121, 315). It was quite recognisably described by Lasch and also by Ricken (*Die Bl.*, p. 292). It is characterized by dull brownish non-striate scaly cap combined with ultramarine-violaceous or bluish stem, which soon fades to steel-grey-bluish and may entirely lose the blue tinge when old, and spores 10–13(14)/7–8½ μ. It differs from *L. lampropus* (also with brown cap and blue stem) chiefly in being more robust, the non-striate more scaly cap and whiter gills. *L. caerulea* differs in having a blue cap as well as stem, but faded specimens may appear very similar.

Cap 18–64 mm., often *robust*, convex then expanded, often truncate- or obtusely-umbonate, sometimes with a slight central depression, *sepia-horn or vandyke often darker at centre and paler towards margin*, pallid-buff or grey-horn when dry, *entirely minutely adpressed scaly* except sometimes at centre or extreme margin, these scales denser towards centre and sometimes arranged radially in the outer part, giving a rimose-striate appearance, *not pellucid-striate* except sometimes when very old and wet. *Gills* adnate usually ventricose, *white then whitish* or pale pinkish then deeper pinkish or slightly brownish pink, crowded, L 22–35 l 3–7(11), edge concolorous or paler, even or uneven. *Stem* 30–80/2–5 mm., equal or slightly thickened at base, sometimes compressed, *ultramarine-violaceous or -bluish, soon fading to steel-grey-violaceous or grey-brown with slight blue tinge, often finally coloured like cap* and entirely, except sometimes near base, without blue tinge, white silky-fibrillose striate at least at first and sometimes scattered floccose-fibrillose scaly, apex not or slightly white pruinose, hollow and cartilaginous, base white tomentose, sometimes strongly so. *Flesh* whitish in centre of cap and stem, brownish under cap cuticle, bluish or violaceous in stem cortex then fading. *Smell* none. *Spores* 10–13(14)/7–8½ μ, ellipsoid-oblong angular (Fig. 315). *Gill edge* fertile but with a few fusiform or slightly lageniform cells projecting here and there, 30–50/8–12 μ.

In grass Edzell, Angus, 1 Sept. 1950; Freshfield, Lancs., 6 Sept. 1951; Broomfield Hill, Som., 14 Aug. 1958.

Leptonia caerulea sp.nov. (Fig. 316)

Pileus 15–50 mm., e convexo expansus mox umbilicatus vel leviter depressus, ad marginem interdum undulato-lobatus, juventute lucide-cyaneus mox colore griseocyaneo vel sordide brunneolo-cyaneo pallescens, postremo totus fuscus vel colore cornus tinctus, jove pluvio exstriatus, totus minute fibrilloso-squamulosus, squamulis ad discum majoribus, siccitate nitidescens vel ad marginem radialiter fibrillosus. Lamellae adnatae vel dente decurrentes interdum emarginatae, e luteolo et vulgo juxta marginem pilei cyaneotincto albidae dein sordide ochraceo-incarnatae interdum hac atque illac luteolotinctae, postremo sordide brunneo-incarnatae, subconfertae, L 24–30 l 3–7, ad aciem minute flocculosae interdum senectute distincte obscuriore brunneae. Stipes 20–50/1½–5 mm., aequalis vel ad basim incrassatus, primo cyaneus dein pileo simile pallescens sed vulgo longiori tempo quam pileo cyaneotinctus, ad apicem vulgo pallidiore coloratus et minute pruinosus, squamulis minutis flocculosis fibrillosis praecipue supra obtectus, e farcto cavus, ad basim albo-tomentosus. Caro concolorata intus alba. Odor nullus vel debilis. Sporae ellipsoideo-oblongae 5–6-angulatae, 9–12/(6½)7–8 μ (Fig. 316). Basidia 4-sporigera. Cellulae steriles aciei lamellarum cylindrico-clavatae vel leviter acute lageniformes, 30–40/6–12 μ.

Inter graminos et Salicem repentem, Freshfield, Lancs, 6 Sept. 1951 et 9 July 1956 (typus in Herb. Kew.). Senectute L. griseocyanea aliquantum similis, sed juventute e coloribus cyaneis lucidis et lamellis luteolotinctis distinctissimus.

Cap 15–50 mm., convex then expanded umbilicate or slightly depressed, margin sometimes wavy-lobed, *bright ultramarine-blue when young and fresh*, *soon fading to greyish blue or brownish blue*, finally entirely sepia-horn to dark sepia, *not striate* when moist, entirely minutely fibrillose-scaly, scales largest round centre, becoming shiny when dry, sometimes slightly radially fibrillose at margin. *Gills* adnate with tooth sometimes emarginate, *yellowish at first* and often with slight blue tinge near edge of cap, *soon whitish then pinkish buff* but sometimes tinged yellowish in places, finally dirty brownish pink, subcrowded, L 24–30 l 3–7, edge minutely flocculose, concolorous or when old darker brownish. *Stem* 20–50/1½–5 mm., equal or slightly thickened at base, *ultramarine-blue then fading to grey-brownish like cap* but often retaining blue tinge for longer than cap, apex often paler and minutely pruinose, minutely flocculose-fibrillose especially in upper part, stuffed then hollow, base white tomentose. *Flesh* concolorous, white in centre of cap and stem. *Smell* none or faint, pleasant. *Spores* ellipsoid-oblong 5–6-angular, 9–12/(6½)7–8 μ (Fig. 316). *Basidia* 4-spored. *Gill edge* with sterile cells cylindric-clavate or slightly fusiform-pointed, 30–40/6–12 μ.

In grass and amongst *Salix repens*, Freshfield, 6 Sept. 1951 and 9 July 1956 (type in Herb. Kew). I have also collected this agaric on a few other occasions in grass in woods or in fields, but as I did not make descriptions these records are not included. Resembles *L. griseocyaneus* when old but traces of bright blue often remain at the stem apex or the gills retain a yellowish shade in places; very distinct when young and fresh because of the very bright blue cap and stem and yellowish gills. This may be the same as the original *Agaricus ardosiacus* Bull., judging by the colours in the Bulliard plate.

Leptonia cephalotricha sp.nov.

Pileus 5–16 mm., e convexo expanso-convexus vulgo truncato-umbonatus, interdum leviter umbilicatus, ad marginem senectute interdum lobatus vel fissuratus vel revolutus, albus dein interdum hac atque illac praecipue ad discum incarnato vel sordide luteolo tinctus, minute albo-sericeo-flocculosus vel squamulosus (squamulis ad discum confertioribus) vel sericeo-nitidus, ad marginem juventute eleganter ciliato-fimbriatus. Lamellae adnatae, vulgo dente decurrentes vel subdecurrentes, albae dein incarnatae, distantes, L ca. 10–12 l 0–1, ad aciem fere integrae. Stipes 10–35/0·5–1·3 mm., ± aequalis, albus dein albidus vel leviter sordide luteolo vel brunneolo tinctus, ad apicem minute pubescente-pruinosus, infra leviter sericeo-fibrillosus, farctus. Caro tenuissima, alba, interdum in stipite albida. Odor farinaceus. Sporae ellipsoideo-oblongae angulatae, 9–11/6–7 μ. Basidia 4-sporigera, ca. 30–40/9–11 μ. Acies lamellarum fertilis. Cellulae ultimae hypharum pilei cylindrico-capitatae, 40–80/3–5 μ, ad capitulum (5)7–10 μ latae. Cellulae ad apicem stipitis similes longiores, 35–160/2–5 μ ad capitulum (4)6–10 μ latae.

Ad terram in silvis nemorosis, Tuck's Plantation, Surlingham, Norfolk, 19 Oct. 1956 (typus in Herb. Kew.). A cellulis peculiaribus ad pileum et ad apicem stipitis, statura parva, coloribus albis vel pallidis insignis. L. sericella a statura robustiore, absentia cellularum peculiarum differt. Eccilia molluscus (Lasch) Reid sensu Reid non Lasch et E. molliuscula (Lasch) Quél. idem est.

Cap 5–16 mm., convex then expanded-convex, often truncate umbonate, sometimes also slightly umbilicate, margin sometimes becoming lobed and torn or upturned, *white then sometimes with slight pinkish or dirty yellowish tinge in places* especially at centre, *minutely white silky-flocculose or flocculose-scaly* (scales densest at centre) or silky-shiny, margin delicately ciliate-fringed when fresh. *Gills* adnate, often with tooth, or subdecurrent, white then pinkish, distant, L *ca.* 10–12 l 0–1, edge even. *Stem* 10–35/0·5–1·3 mm., ± equal, *white then discolouring whitish* or slightly dirty yellowish or brownish, apex minutely pubescent-pruinose, remainder slightly silky-fibrillose, stuffed. *Flesh* very thin, white in cap, white or whitish in stem. *Smell* mealy. *Spores* ellipsoid-oblong angular, 9–11/6–7 μ. *Basidia* 4-spored, *ca.* 30–40/9–11 μ. *Gill edge* fertile. End cells of hyphae of cap cuticle *cylindric-capitate*, 40–80/3–5 μ, at capitulum (5)7–10 μ diam. Similar but often longer cells at stem apex, 35–160/2–5 μ, head (4)6–10 μ diam.

On soil in shady woods: Tuck's Plantation, Surlingham, 19 Oct. 1956 (type in Herb. Kew); Frithsden Beeches, Berkhamsted, Herts, 2 Oct. 1955 (legit D. A. Reid). Readily recognized by peculiar cells on cap and at stem apex, small stature and white or pale colour. *L. sericella* is more robust and lacks these capitate cells.

This is *Eccilia molliusculus* (Lasch) Quél. s. Quélet and *Rhodophyllus molliusculus* (Lasch) Romagn. s. Romagnesi; it was described and recorded for Britain by Reid (these *Trans.* **41** (1958), 433) as *E. molluscus* (Lasch) Quél. Reid pointed out that both Quélet and Romagnesi had copied Fries's error of spelling in *Epicrisis* and later works, where Fries places 'A. molliusc. Lasch' as a synonym of *Agaricus sericellus*, plainly referring to *A. molluscus* Lasch, which is listed in the index to *Syst. Mycol.*, III, correctly spelt *molluscus* as 'A. sericell β dist. spec?' *A. molluscus* was described by Lasch as a relatively robust fungus 'pileus 1–$1\frac{1}{4}$ unc. latus...stipes $1\frac{1}{2}$–2 unc. longus, 1–$1\frac{1}{2}$ lin. crassus' and as having the cap 'floccis densis subfibrillosis innatis' and stem 'albofloccosus et fibrillosus'. I therefore think that Fries was right in synonymizing *A. molluscus* with *A. sericellus*; for this reason and since Quélet's binomial was founded on an error neither *molluscus* nor *molliusculus* is available for this fungus and I have described it as a new species.

Leptonia cyaneoviridescens sp.nov. (Fig. 317)

Pileus 8–17 mm., e convexo expansus leviter umbilicatus, obscure cyaneo-niger mox pallescens et a disco marginem versus lucide sulphureo-viride tinctus, ad marginem interdum cyaneo-violaceo tinctus, primo totus minute sericeo-tomentosus dein sub lente tomentoso-squamulosus, interdum ad marginem squamulis densioribus radialiter striatus, jove pluvio pellucido-striatus, ad marginem interdum laceratus. Lamellae adnatae interdum emarginatae vel dente decurrentes, pallide cyaneae dein glauco-cyaneae praecipue juxta carnem pilei luteolo-viride tinctae, postremo sordide brunneo-incarnatae, subconfertae, L 18–20 l 3–7, ad aciem interdum pallidiore coloratae. Stipes 22–38/1–2 mm., aequalis vel ad basim leviter incrassatus, vulgo flexuosus, cyaneo-niger sursum colore viride-cyaneo vel griseo-glauco-viride pallescens, glaber, ad apicem interdum leviter albido-pruinosus, e farcto cavo, ad basim a mycelio sulphureo tomentosus. Caro pallide cyanea dein viride-cyanea, interdum ad basim stipitis pallidiore colorata, intus cyaneo-alba. Odor nullus vel sapori similis. Sapor leviter rancido-oleaceus. Sporae ellipsoideo-oblongae 5–6-angulatae, (9)10–12/6–7½ μ (Fig. 317). Basidia 4-sporigera, 32–38/10–12 μ. Acies lamellarum fertilis. Hyphae cuticulae pilei filamentosae, ramosae, (3)5–16 μ latae, incrustato-pigmentatae. Hyphae mycelii ad basim stipitis sulphureo-luteae, sub micr. 2–10 μ latae, forte incrustato-pigmentatae.

Inter muscos et graminos, River Affric, Tomich, Inverness-shire, 18 Sept 1958 (typus in Herb. Kew.). L. lazulina proxime accedit, sed a mycelio sulphureo et pileo lamellisque viridescentibus facile distinguitur.

Cap 8–17 mm., convex then expanded slightly umbilicate, *deep ultramarine-blue-black, soon paler bluish and tinged bright sulphur-greenish from disk out,* margin sometimes tinged blue-violaceous, entirely minutely silky-tomentose at first then minutely tomentose-scaly under lens (scales at centre denser and larger), sometimes appearing radially striate at margin from denser scales in radial streaks, pellucid-striate when moist, margin sometimes lacerate. *Gills* adnate, sometimes emarginate or with tooth, *pale ultramarine-blue then glaucous-bluish tinged yellow-greenish* especially near flesh of cap, finally grey-brownish pink, subcrowded, L 18–20 l 3–7, edge sometimes paler. *Stem* 22–38/1–2 mm., equal or slightly swollen at base, often flexuose, *ultramarine-blue-blackish fading to greenish blue* or glaucous-greenish grey from base up, smooth, matt, apex sometimes slightly whitish pruinose, stuffed then hollow, base *sulphur-yellow tomentose* from the yellow mycelium. *Flesh* pale ultramarine-blue then greenish blue, sometimes paler in stem base, bluish white in centre of cap and stem. *Smell* none or slightly rancid-oily. *Taste* slightly rancid-oily. *Spores* ellipsoid-oblong 5–6-angular, (9)10–12/6–7½ μ (Fig. 317). *Basidia* 4-spored 32–38/10–12 μ. *Gill edge* fertile. Hyphae of cap cuticle filamentous, branched, (3)5–16 μ diam., encrusted-pigmented. Hyphae of mycelium at stem base sulphur-yellow sub micr. (daylight), 2–10 μ diam., strongly encrusted-pigmented.

In short grass and moss, River Affric, Tomich, 18 Sept. 1958 (type in Herb. Kew). Nearest to *L. lazulina* but very easily distinguished by the sulphur-yellow mycelium and cap and gills becoming sulphur-greenish.

Leptonia fulva sp.nov. (Figs. 129–134, 318)

Pileus 12–50 mm., e convexo vulgo leviter umbilicato raro papillato vel umbonato expansus, vulgo postremo umbilicatus vel depressus, fulvo-brunneus (colori Amanitae fulvae fere similis) ad discum fuscus vel obscure brunneus, ad marginem haud raro clariore fulvo-tinctus, siccitate sordide ochraceus vulgo fulvo-tinctus, jove pluvio ad discum striatus, jove sicco sericeo-nitidus, primo squamulis minutis obscurioribus fibrillosis fere totus dein solum ad discum obtectus. Lamellae adnatae, interdum secedentes, ex albido pallide ochraceae vel luteolo-incarnatae, interdum colore pilei tinctae, postremo sordide ochraceo-incarnatae, subconfertae, L 16–26 l 3–7, ad aciem interdum inaequales vel senectute leviter obscuriore coloratae. Stipes 30–90/1–4 mm., aequalis vel ad basim incrassatus, pallide ochraceus vel fulvo-brunneus, quam pileus pallidiore coloratus, ad apicem interdum albidus, glaber, interdum leviter sericeo-striatus, e farcto avus, ad basim albido-tomentosus. Caro pileo concolorata, intus albida. Odor nullus. Sapor leviter rancido-oleaceus. Sporae ellipsoideo-oblongae 5–6-angulatae, 10–13(14)/7–8 μ (Fig. 318). Basidia 4-sporigera. Acies lamellarum fertilis dein interdum sterilis, cellulis sterilis cylindrico-clavatis, 30–60/8–16(20) μ. Hyphae cuticulae pilei filamentosae, 6–20 μ latae, vacuolato-pigmentatae.

In campis vel in locis graminosis vel muscosis in silvis: Lower Tullochgrue, Rothiemurchus, Inverness-shire, 27 Aug. 1955 (typus in Herb. Kew.). A coloribus fulvo-tinctis insignis; L. andrianae Bres. sensu F. H. Møller non Bres. idem censeo. L. andrianae sensu Bres. a pileo 'roseo-carneolo dein fulvo-castaneo', carne incarnato-tincta, L. whiteae (Murrill) Murrill a sporis majoribus differunt.

Cap 12–50 mm., convex, often slightly umbilicate but more rarely papillate or slightly umbonate at first then expanded usually finally umbilicate or depressed, *yellow-brown tinged tawny* (much the colour of *Amanita fulva*), *often sepia or vandyke at centre, margin sometimes with brighter tawny tinge*, sometimes fading with age, drying dirty ochraceous or buff often with tawny tinge, striate to centre when moist, silky shiny when dry, at first almost entirely minutely fibrillose-scaly then at or round centre only. *Gills* adnate sometimes separating, *whitish then pale ochraceous or yellowish flesh colour*, sometimes tinged colour of cap, finally pallid pinkish buff, subcrowded, L 16–26 l 3–7, edge sometimes uneven or slightly darker when old. *Stem* 30–90/1–4 mm., equal or slightly thickened at base, *concolorous with but paler than cap*, pale ochraceous or pale buff, apex sometimes whitish, smooth, matt or slightly silky-striate, stuffed then hollow, base white tomentose. *Flesh* concolorous, whitish in centre of cap and stem. *Smell* none. *Taste* slightly oily-rancid. *Spores* ellipsoid-oblong 5–6-angular, 10–13(14)/7–8 μ (Fig. 318). *Basidia* 4-spored. *Gill edge* fertile but sometimes becoming sterile and then with cells ± cylindric-clavate, 30–60/8–16(20) μ. Hyphae of cap cuticle filamentous, 6–20 μ diam. with vacuolar pigment.

In grass or moss in fields or woods: Loch-an-Eilean, Rothiemurchus, 26 Aug. 1955; Lower Tullochgrue, Rothiemurchus, 27 Aug. 1955 (type in Herb. Kew); Membury, Devon, 1 Nov. 1957; Broomfield Hill, Broomfield, Som., 14 Aug. 1958.

This rather bright-coloured agaric is not uncommon and is widespread in Britain; it is readily recognizable by the tawny tinge (the cap is deep ochre tinged tawny when fresh and moist), striate cap and spore size. Yet I cannot find it convincingly described anywhere except by F. H. Møller as *L. andrianae* Bres. I do not think this epithet is suitable, however, since Bresadola describes the cap of *L. andrianae* as being rosy-flesh then tawny-chestnut and the flesh as turning pinkish in places, 'pileus glaber, margine tenuiter striatus, roseo-carneolus dein fulvo-castaneus' and flesh 'fracta dilute roseola'. *L. whiteae* (Murrill, 1917) Murrill, 1917, is similarly coloured but has spores 12–16½/7–9½ μ and marginal cells with pale yellowish brown contents sec Romagnesi & Favre (RM, **3** (1938), 68, Pl. $2^{1,2}$). *L. fulva* differs from *L. sarcitula* and *L. majuscula* in brighter colours and other details. The gill edge is rather variable as in some other *Leptonia* spp.; this variability together with the puzzling colour changes undergone by many of these fungi makes the task of sorting them out rather difficult and best not attempted until one has made plenty of descriptions from fresh material.

Leptonia indutoides sp.nov. (Figs. 124–125, 319, 432, 433)

Pileus 12–30 mm., e convexo expanso-convexus ± umbilicatus vel leviter depressus, color cornus vel fusco-umbrinus interdum ad partem externam olivaceo-brunneus, jove pluvio exstriatus, vulgo ad discum squamulis leviter adpressis flocculoso-fibrillosis obtectus, jove sicco forte sericeo-nitidus vel obscuriore radialiter lineatus. Lamellae adnatae dente decurrentes vel leviter emarginatae, fere planae sed vulgo leviter ventricosae, colore cornus pallide tinctae vel brunneolo-albae dein pallide incarnatae vel leviter brunneolo-tinctae postremo brunneolo-tinctae, subconfertae, L 20–24 l 1–3, vulgo aliquantum crassae et ad basim venosae, ad aciem albae vel pallidiore coloratae, integrae vel minute flocculoso-denticulatae. Stipes 15–28/2–3 mm., aequalis vel deorsum attenuatus vel ad apicem incrassatus, interdum leviter excentricus, pallide fuscus vel sordide luteolo-brunneus, interdum leviter olivaceo-brunneo tinctus, interrupte albo-sericeo striatus, ad apicem albido-pruinosus, e farcto cavus. Caro juxta lamellas et in cuticulam stipitis colore cornus pallide tincta, intus albida vel alba. Odor et sapor nulli. Fungus primo totus firmus et lentus est. Sporae ellipsoideo-oblongae undulato-angulatae 11–14/7½–10 μ (Fig. 319). Basidia 4-sporigera, 44–50/11–13 μ. Acies lamellarum fertilis sed cystidiis sparsis ± lageniformibus vel irregulariter cylindrico-flexuosis 50–120/10–22 μ, ad apicem 4–10 μ latis (Fig. 433). Hyphae cuticulae pilei filamentosae, cellulis 4–22 μ latis, brunneo vacuolato-pigmentatis, hac atque illac nigro-brunneo lineato pigmentatis (Fig. 432).

In pratis, Ingleton, Yorks, 28 Aug. 1958 (typus in Herb. Kew.). A L. induta absentia odoris et veli, cystidiis minus acutis, a L. inocybeoide cystidiis, tinctis olivaceo-brunneis, sporis differt. L. pulverea et L. babingtonii obscuriore coloratae sunt.

Cap 12–30 mm., convex then expanded-convex ± umbilicate or slightly depressed, *sepia-horn or vandyke*, *sometimes with dirty olive-brown or buff tinge in outer part*, *not striate when moist*, often slightly adpressed flocculose-fibrillose scaly at or round centre, when dry with *marked silky-atomate sheen or sometimes marked with darker blackish radial streaks*. *Gills* adnate with tooth or slightly emarginate ± plane but often slightly ventricose, *pale horn or brownish white* then whitish pink generally with brownish tinge near flesh of cap, finally brownish pink, subcrowded, L 20–24 l 1–3, often rather thick and slightly veined at base, edge white or paler, even or minutely flocculose-denticulate. *Stem* 15–28/2–3 mm., equal or attenuated downwards or thickened at apex, sometimes slightly excentric, *pallid buff or pale sepia sometimes with slight olive-brown* tint, white silky interrupted-striate, apex whitish pruinose, stuffed then hollow. *Flesh* pale horn over gills and in stem cortex, white or whitish in centre. *Smell* and *taste* none. *Whole fungus rather firm and tough at first*. *Spores* ellipsoid-oblong wavy-angular, *11–14/7½–10 μ* (Fig. 319). *Basidia* 4-spored, 44–50/11–13 μ. *Gill edge* fertile but with scattered ± lageniform or irregularly cylindric-flexuose cells, 50–120/10–22 μ, apex 4–10 μ (Fig. 433). Hyphae of cap cuticle filamentous, cells 4–22 μ diam., with brownish vacuolar pigment and in places also *strips of dark black-brown pigment* (Fig. 432).

In fields: Ingleton, 28 Aug. 1958 (type in Herb. Kew); Northern Grassland, Malham, Yorks, 30 Aug. 1958. (Both localities limestone pasture.) Differs from *L. induta* in absence of smell and veil and in the less pointed marginal cystidia; *L. inocybeoides* has similar dark-pigmented cells in the cap cuticle but has no cystidia nor olive-brown tints and has differently shaped many-angled spores. *L. pulverea* and *L. babingtonii* are much darker and the latter has larger spores.

Leptonia inocybeoides sp.nov. (Figs. 122–123, 320, 431)

Pileus 6–17 mm., e convexo expanso-convexus interdum leviter umbonatus, fuscus vel sordide luteolo-brunneus interdum ad discum umbrinus, squamulis minutis fibrillosis adpressis vel leviter squarrosis ad discum vulgo confertioribus interdum radialiter obtectus, jove pluvio exstriatus, ad marginem pallidiore coloratus et interdum glabrior vel radialiter fibrillosus vel fissuratus. Lamellae anguste adnatae vel fere liberae interdum leviter emarginatae, ex albo vel albido pallide incarnatae vel leviter sordide brunneolo-tinctae, postremo roseo-incarnatae, subdistantes, L 12–16 l 1–3, ad aciem fere integrae. Stipes 15–30/0·75–2 mm., ± aequalis, pileo concoloratus vel ad basim obscuriore vel ad apicem pallidiore coloratus, minute interrupte sericeo-striatus, ad apicem vulgo albopruinosus, anguste cavus, ad basim albotomentosus. Caro tenuissima, albida. Odor nullus. Sporae ellipsoideae multo-angulatae, 11–14/7–8 μ (Fig. 320). Basidia 4-sporigera. Acies lamellarum fertilis. Cystidia nulla. Cellulae hypharum squamularum pilei ellipsoideo-cylindricae, 8–20 μ latae, brunneo-vacuolatae, hac atque illac nigro-brunneo lineato pigmentatae (Fig. 431).

Inter graminos, Dawlish Warren, Devon, 17 Nov. 1956 (typus in Herb. Kew.). A sporis, pileo squamuloso, statura facile dignoscitur.

Cap 6–17 mm., convex then expanded-convex sometimes slightly umbonate, *sepia-horn or pallid-buff*, sometimes vandyke at centre, *minutely fibrillose-scaly scales adpressed or slightly reflexed at tips*, usually denser at centre and with tendency to be radiate distally, not striate when moist, margin paler, sometimes smoother or ± radially fibrillose or split. *Gills* narrowly adnate or almost free, sometimes slightly emarginate, *white or whitish then pale pink* or with very faint dirty brownish tinge, finally pinkish flesh colour, rather distant, L 12–16 l 1–3, edge concolorous ± even. *Stem* 15–30/0·75–2 mm., ± equal, concolorous or slightly darker at base or paler at apex, minutely interruptedly silky-striate, apex often scattered white pruinose, narrowly hollow, base white tomentose. *Flesh* very thin, whitish. *Smell* none. *Spores* ellipsoid *many-angled*, angles small and rounded, *11–14/7–8* μ (Fig. 320). *Basidia* 4-spored. *Gill edge* fertile. *Cystidia* none. Cells of hyphae of scales on cap cylindric-ellipsoid, 8–20 μ diam., with brownish vacuolar pigment and in some places *strips of dark blackish brown pigment* (Fig. 431).

In grass, Dawlish Warren, 27 Oct. 1956 and 17 Nov. 1956 (type in Herb. Kew). Readily distinguished by spores, scaly cap and gills at first whitish. Although rather like a *Nolanea* in shape I have included this in *Leptonia* because of the scaly cap. I think this might be the same as the original *Agaricus asprellus* Fries (1821), but prefer to abandon this epithet.

Leptonia nigroviolacea sp.nov. (Fig. 321)

Pileus 23–45 mm., e convexo expansus vulgo leviter umbilicatus, totus nigro-violaceus interdum ad discum fere niger vel ad marginem clariore violaceus, dein violaceo-brunneus vel sordide fuscus interdum ad marginem persistentiore violaceo-tinctus, jove pluvio exstriatus, ad discum minutissime squamulosus vel areolatus, circa discum fibrilloso-lineatus vel squamulis leviter revolutis obtectus, ad marginem minute fibrilloso-squamulosus dein glabrescens vel leviter rimosus vel radialiter fibrillosus. Lamellae adnatae interdum leviter emarginatae, vulgo ± ventricosae, ex albido vel sordide cremeo pallide brunneo-griseae vel incarnato-brunneo-griseae dein sordide incarnatae, subconfertae, L 24–30 l 3–7, ad aciem integrae. Stipes 50–70/2–4 mm., aequalis vel ad basim leviter incrassatus, interdum compressus (< 7 mm. latus), violaceo-chalybeus dein griseo-violaceo-cyaneus interdum ad apicem obscuriore coloratus, pileo simile pallescens sed persistentiore cyaneotinctus, minute sericeo-striatus vel fere glaber, ad apicem albido-pruinosus, mox cavus, aliquantum fragilis, ad basim albo-tomentosus. Caro tenuis, in mediam partem pilei stipitisque albida, juxta lamellas colore cornus tincta, sub cuticula pilei violaceo-tincta. Odor nullus. Sapor leviter rancido-oleaceus. Sporae ellipsoideo-angulatae, (9)10–12/6½–8 μ (Fig. 321). Basidia 4-sporigera. Acies lamellarum fertilis. Cystidia nulla.

In campis, Tomich, Inverness-shire, 27 Aug. 1957 (typus in Herb. Kew.). Coloribus juventute violaceis, lamellis primo albidis vel sordide cremeis pileo jove pluvio exstriato insignis. A L. placida coloribus magis violaceis sporis minoribus habitatione differt. A L. chalybaea lamellis primo non caeruleotinctis pileo exstriato distinguitur.

Cap 23–45 mm., convex then expanded, often slightly umbilicate, *entirely blackish violaceous*, sometimes almost black at centre, *or brighter violet at margin, then fading to pallid-violaceous* finally pallid sepia or buff, persistently darker at centre, sometimes remaining tinged violaceous at margin for a long time, *not striate* when moist, very minutely scaly or cracked-scaly at centre, fibrillose-streaky or slightly recurved scaly round centre, at margin minutely fibrillose-scaly or tomentose then becoming smooth or slightly rimose or radially fibrillose. *Gills* adnate sometimes slightly emarginate, often ± ventricose, *whitish or slightly dirty cream then pale brownish grey or pinkish brownish grey* to pallid-pinkish, subcrowded, L 24–30 l 3–7, edge ± even, concolorous. *Stem* 50–70/2–4 mm., equal or slightly thickened at base, sometimes compressed (< 7 mm. diam.), *violaceous-steel-blue then grey-violaceous-blue* sometimes darker at apex, *fading like cap but retaining blue tinge for a longer time*, minutely silky-striate or ± smooth, apex white pruinose at first, soon hollow, rather fragile and tending to split lengthwise, base white tomentose. *Flesh* thin, whitish in centre of cap and stem, horny over gills, tinged violaceous under cap cuticle. *Smell* none. *Taste* slightly oily-rancid. *Spores* ellipsoid, angular, (9)10–12/6½–8 μ (Fig. 321). *Basidia* 4-spored. *Gill edge* fertile. *Cystidia* absent.

In grass field, Tomich, 27 Aug. 1957 (type in Herb. Kew). Distinguished by violaceous fresh colours of cap and stem (not steel- or ultramarine-blue) combined with creamy or whitish young gills and non-striate moist cap. Resembling *L. placida* but more distinctly violet, with smaller spores and different habitat. Has doubtless been named *lampropus* in the past, but this epithet should be retained for an agaric without blue tints in the cap to agree with the original diagnosis (Fries, 1821).

Leptonia pernitrosa sp.nov. (Figs. 135–136, 322)

Pileus 10–50 mm., e convexo expansus vulgo umbilicatus, raro leviter papillatus, pallide fuscus vel color cornus, siccitate albidus vel pallide sordide ochraceus, jove pluvio pellucido-striatus, jove sicco radialiter lineatus dein sericeo-nitidus, ad marginem primo incurvatus interdum undulato-lobatus. Lamellae adnatae, vulgo emarginatae vel juxta stipitem latae, ex albo albidae dein incarnato-tinctae, postremo roseo-incarnatae, subconfertae, L 16–24 l (3)7–11, interdum venosae, ad aciem integrae. Stipes 25–60/1–5(7) mm., deorsum attenuatus vel fere aequalis vel ad apicem vel ad basim leviter incrassatus, raro leviter fusiformis, sordide albidus vel pileo concoloratus interdum supra pallidiore coloratus, glaber, sub lente albo-sericeo nitidus, ad apicem interdum leviter albo-pruinosus, fere rigidus sed facile frangens, e farcto cavus, ad basim haud albo-tomentosus. Caro alba vel albida. Odor persistente nitrosus, juventute fortis. Sporae late ellipsoideae, angulatae, 8½–11/7–8½ μ (Fig. 322). Basidia 4-sporigera. Acies lamellarum fertilis. Cystidia nulla.

Ad terram palustrem, Studland, Dorset, 21 Nov. 1955 (typus in Herb. Kew.). Ab E.

nidorosum statura graciliore, odore nitroso persistentiore, stipite exstriato facile frangente, lamellis late adnatis et habitatione in palustris differt. L. polita proxime accedit sed ab absentia odore nitroso, stipite minus rigido, coloribus obscurioribus differt.

Cap 10–50 mm., convex then expanded, usually umbilicate rarely slightly papillate, *pale sepia or sepia-horn or wood-brown*, drying pale pallid buff or whitish from centre, often radially streaky when half dry, pellucid-striate when moist, when dry *with shiny silky sheen*, margin incurved at first, sometimes becoming wavy-lobed in larger specimens. *Gills* adnate often broadly so, usually emarginate and broad near stem (sometimes very broad, e.g. 12 mm. for cap 50 mm.), *white then whitish or tinged pink*, finally pinkish flesh colour, subcrowded, L 16–24 l (3)7–11, sometimes veined on sides, edge ± even. *Stem* 25–60/1–5(7) mm., attenuated downwards or equal or with slightly thickened base or apex or rarely slightly fusiform, pallid whitish or almost colour of cap, sometimes paler at apex, smooth with white silky sheen under lens, apex sometimes slightly white pruinose, *rather firm and stiff but snapping easily*, stuffed then hollow, base not or scarcely white tomentose. *Flesh* white or whitish. *Smell persistently nitrous*, strong when fresh. *Taste* soon nasty of rancid garlic. *Spores* broadly ellipsoid, angular, 8½–11/7–8½(9) μ (Fig. 322). *Basidia* 4-spored. *Gill edge* fertile. *Cystidia* none.

In marshy ground on soil: Studland, 21 Nov. 1955 (type in Herb. Kew); Cadover Bridge, Shaugh, Devon, 2 Aug. 1953; Grayswood Common, Surrey, 14 Oct. 1942 (legit A. A. Pearson; described in his notebook now in Herb. Kew as '*E. nidorosum* var. *umbilicatum* nov.var.').

Differs from *E. nidorosum* in more slender stature, more constant and persistent nitrous smell, stem not striate, stiff but snapping easily, gill attachment and habitat. *L. polita* is very similar but does not smell persistently nitrous and has a darker stem and spores 9–11/6–7½ μ. After much experience in the field I am sure that the nitrous smell of some of these agarics is not always a good diagnostic feature. Besides *E. nidorosum*, which in my experience may or may not smell nitrous, both *E. sericatum* (normally smelling mealy) and *L. polita* occasionally smell nitrous. Whenever I have collected *L. pernitrosa*, however, I have been struck by the strong and persistent nitrous smell, so that I believe this to be the exception that proves the rule.

Leptonia pyrospila sp.nov. (Figs. 126–128)

Pileus 12–38 mm., e convexo expansus, interdum primo papillatus, expansione interdum leviter umbilicatus, glauco-griseo-cyaneus vel griseo-cyaneo-fuscus, interdum ad discum obscuriore fuscus vel brunneus dein pallescens et vulgo ad marginem pallidiore coloratus, jove sicco pallide sordide-brunneus vel -ochraceus et sericeo-notatus vel leviter radialiter fibrillosus vel subrimosus, ad vel circa discum minute squamulosus, jove pluvio ad marginem striatus. Lamellae adnatae interdum dente decurrentes vel fere liberae, e pallide glauco-cyaneo vel albido leviter glauco-cyaneo tincto mox sordide cremeae vel cremeo-incarnatae dein pallide brunneo-incarnatae, postremo obscuriore incarnatae, subconfertae, L 16–20 l 3(7), ad aciem concoloratae dein praecipue juxta marginem pilei interdum brunneo-flocculosae. Stipes 32–70/1½–4 mm., aequalis vel hac atque illac incrassatus, interdum compressus vel canaliculatus, pallide glauco-cyaneus vel glauco-griseus dein sordide glauco-viridulus vel viridulo-brunneolus, postremo sordide luteolo-brunneus vel infra luteolo-tinctus et ad apicem pallidiore coloratus, senectute ad basim haud raro miniato vel aurantiaco-ochraceo tinctus, ad apicem albopruinosus, infra glaber vel sub lente interrupte albo-sericeo striatus, e farcto cavus, aliquantum fragilis, ad basim albotomentosus plerumque a mycelio miniatus vel carotae coloratus, eis tinctis interdum senectute obscurascens rariore fere absentibus. Caro concolorata, tenuissima, vulgo juxta lamellas et in corticem stipitis colore cornus tincta, ad basim stipitis plerumque carotae colorata vel miniato vel aurantiaco-ochraceo tincta. Odor nullus. Sporae ellipsoideo-oblongae, angulatae, 10–12/6½–8½ μ. Basidia 4-sporigera. Cellulae steriles aciei lamellarum catervatim clavatae vel cylindrico-clavatae, 30–100/(7)10–20 μ.

In campis, Tomich, Inverness-shire, 27 Aug. 1957 (typus in Herb. Kew.). A mycelio carotae colorato vel miniato et coloribus glauco-tinctis pallescentibus facile distinguitur. L. exilis a pileo haud expanso, statura graciliore, coloribus juventute magis viride tinctis, absentia mycelii colorati differt.

Cap 12–38 mm., convex then expanded, sometimes papillate at first, when expanded sometimes slightly umbilicate, *glaucous-grey-bluish or grey-bluish sepia*, often darker sepia or vandyke at centre *then discolouring sepia or dirty brownish often with paler margin*, drying pale dirty buff or pallid-ochraceous, striate at margin when moist, drying silky streaky or slightly radially fibrillose or subrimose, minutely scaly at or round centre. *Gills* adnate, sometimes with tooth, to ± free, *pale glaucous-bluish* or whitish with slight glaucous-blue tinge in places (especially near cap edge), *soon creamy pallid or creamy pinkish* then pallid pinkish or brownish pink finally deeper flesh pinkish, subcrowded, L 16–20 l 3(7), edge concolorous then sometimes brownish flocculose especially near edge of cap. *Stem* 32–70/1½–4 mm., equal or slightly thickened in places, sometimes compressed and channelled, *pale glaucous-bluish or glaucous-grey* then pallid glaucous-greenish or dirty greenish pallid, *finally pallid buff or tinged yellowish below* and often paler at apex, when old *sometimes flushed vermilion or orange-ochre at base*, apex white pruinose, remainder smooth or interrupted white silky striate under lens, stuffed then hollow, rather fragile, base white tomentose nearly always with *vermilion or carrot-coloured mycelium*, this colour sometimes deepening with age or more rarely hardly visible. *Flesh* concolorous, very thin, often horny over gills or in stem cortex, usually tinged carrot colour, vermilion or orange-ochraceous in lower part of stem (up to 20 mm. above base). *Smell* none. *Spores* ellipsoid-oblong angular, 10–12/6½–8 μ. *Basidia* 4-spored. *Gill edge sterile* with bunches of clavate or cylindric-clavate cells, 30–100/(7)10–20 μ.

In fields: Tomich, 27 Aug. 1957 (type in Herb. Kew); Membury, Devon, 25 Oct. 1957.

Readily distinguished by carrot or vermilion colour of stem base; when this is rarely apparently absent the stages of discoloration make recognition more difficult. *L. exilis* differs in the scarcely expanding, more persistently papillate cap, slightly more slender stature, absence of carroty or vermilion mycelium at the stem base and more pronounced greenish glaucous colours when young. I have described the carrot colours of the stem-base as mycelial, but I am by no means sure this is so. Observations on the nature and origin of this pigment would be very interesting. This is *Rhodophyllus pyrospilus* Romagn. first described in BSMF, **60** (1944), 96, and later as var. *pyrospilus* Kühn. & Romagn. (1953, p. 204), on both occasions without Latin diagnosis.

LEPTONIA ROSEA Longyear, *Rep. Mich. Acad. Sci.* **3** (1902), 59

The *Leptonia* spp. with pink or red cap and stem are not well known in this country and seem to be rather uncommon. One of the most striking was, however, rather poorly figured (these *Trans.* **3** (1910), Pl. 11) as *Entoloma griseocyaneum* var. *roseum* R. Maire (the yellow on the cap and stem is presumably false, it is not mentioned in the description). This is characterized by having both cap and stem almost uniformly pinkish red and the cap minutely scaly and non-striate. These are also the distinguishing features of *L. rosea* described in North America in 1902. Another agaric with a pinkish cap was recorded and described by A. A. Pearson (these *Trans.* **22** (1938), 12) as *L. queletii* Boudier, which, however, has the stem white or tinged yellowish and not pink and was found under alders or other trees, whereas *L. rosea* is found in the open, chiefly in grass, and both cap and stem are much the same pink. I have therefore maintained *L. rosea* in the 'List' separate from *L. queletii*. Here is a description of British material of *L. rosea* from my notes:

Cap 18–32 mm., convex then expanded-convex, umbilicate, often truncate-convex at first, *rose-pink or pinkish red* sometimes slightly paler at centre, *entirely and rather minutely floccose-scaly*, the scales reddish pink or brownish pink, those at centre sometimes larger or more brownish, not striate when moist but sometimes radially innately fibrillose near margin. *Gills* adnate, ± ventricose, white then pink or slightly brownish pink, subcrowded, L 24–40 l 1–3, edge concolorous, even or slightly uneven. *Stem* 30–40/3–6 mm., equal or attenuated downwards, *rose-pink or pinkish red*, sometimes deeper in places (especially towards apex) or with slight brownish tinge above when old, minutely interrupted silky striate, stuffed then hollow, base white tomentose. *Flesh* white, tinged pink under cap and stem cuticle. *Smell* none. *Taste* none or slightly oily-rancid. *Spores* $8\frac{1}{2}$–11/$6\frac{1}{2}$–8 μ, ellipsoid-oblong angular. *Gill edge* fertile or sterile in places, cells ± fusiform or lageniform, *ca.* 40–60/6–12 μ.

On mossy ground in *Salix repens* dune-slack, Freshfield, Lancs, 3 July 1954, legit J. T. Palmer; in grass in limestone pasture, Ingleton, Yorks, 23 Sept. 1957, legit W. G. Bramley.

We have at least two other *Leptonia* spp. in Britain with pink or reddish cap: (1) *L. catalaunica* Singer, perhaps the most beautiful of all, easily recognized by the grey-blue-violaceous stem combined with pinkish red minutely scaly cap, the margin of which is often also grey-bluish; and (2) *L. queletii* Boud. with stem white then whitish or yellowish and cap rose-pink, minutely scaly and sometimes with paler whitish or yellowish margin. This was recorded and described by A. A. Pearson in these *Trans.* **22** (1938), 12. However, Pearson gave spore measurements 9–11/6–7 μ, in contrast to Boudier's 12–15/8–10 μ, and described the cap colour as 'delicate violaceous-pink, deeper in centre, pale around margin or fawn colour without trace of pink', whereas Boudier says of the cap 'd'un joli rose prenant à la fin une teinte jaunâtre'. Some of Boudier's spore measurements have been found to be too large, but if they are correct in this instance then Pearson's agaric will need a new name; I am not prepared to give a verdict on this without seeing fresh material. The habitats given are more or less in agreement, i.e. under alders by Boudier and under trees by Pearson, and both give stem white. There is also *Agaricus* (Nolanea) *rufocarneus* Berk., 1836 (= *Nolanea rufocarnea* (Berk.) Sacc., 1887) which is most likely a *Leptonia* but awaits rediscovery.

Leptonia sarcitula sp.nov. (Fig. 323)

Pileus 14–34 mm., e convexo expanso-convexus vel fere planus, vulgo umbilicatus, sordide luteolo-fuscus vel brunneolus ad discum obscuriore fuscus vel brunneus, siccitate pallidiore fuscus, jove pluvio striatus, praecipue ad discum minute velutino-squamulosus vel leviter squarroso-diffractus, siccitate sericeo-atomatus et circa discum sericeo-fibrilloso lineatus. Lamellae anguste vel late adnatae, interdum dente decurrentes, lineares vel ventricosae, ex albido pallide incarnato-griseo vel -fuscae dein incarnatae, subconfertae, L ca. 20–22 l 3, ad aciem concoloratae vel pallidiores, integrae vel leviter inaequales. Stipes 27–60/1–3 mm., aequalis vel ad basim rariore ad apicem leviter incrassatus, pallide griseo-cremeus vel colore cornus vel pilei tinctus, ad apicem haud pruinosus, glaber vel leviter minute interrupte sericeo-striatus, e farcto mox cavus, ad basim albotomentosus. Caro pilei fusca vel colore pilei concolorata, juxta lamellas et in cortice stipitis colore cornus tincta, siccitate intus alba vel albida. Odor nullus. Sapor nullus vel levissime oleaceo-rancidus. Sporae ellipsoideo-oblongae angulatae, 10–13/6½–8 μ (Fig. 323). Basidia 4-sporigera. Acies lamellarum fertilis vel in partem sterilis, cellullis subcylindricis vel leviter fusiformibus 5–8 μ diam.

Inter graminos in campis vel in silvis: Plodda Falls, Guisachan, Inverness-shire, 20 Aug. 1955 (typus in Herb. Kew.). A sociis pileo jove pluvio striato sordide luteolo-fusco ad discum obscuriore fusco, stipite pallidiore colorato glabro et lamellis juventute albidis distinguitur.

Cap 14–34 mm., convex then expanded convex to ± plane, usually umbilicate, *sepia-horn colour with slight buff or yellowish tinge, usually with darker sepia or vandyke centre*, drying paler, *striate* when moist, minutely velvety scaly or slightly reflexed cracked-scaly at centre, drying opaque with silky atomate sheen and ± radially silky fibrillose streaky round centre. *Gills* narrowly or broadly adnate sometimes with tooth, linear or ventricose, *whitish then pale pinkish grey or pale pinkish brown*, finally deeper pinkish, subcrowded, L *ca.* 20–22 l 3, edge concolorous or paler, even or slightly uneven. *Stem* 27–60/1–3 mm., equal or slightly thickened at base or more rarely at apex, *pale greyish cream or creamy horn or tinged colour of cap* but paler, apex not or only slightly white pruinose, remainder smooth or slightly interrupted white silky striate, stuffed soon hollow, base white tomentose. *Flesh* sepia-horn or darker in cap, horny over gills or in stem cuticle, drying white or whitish in centre of cap and stem. *Smell* none. *Taste* none or slightly oily rancid. *Spores* ellipsoid-oblong angular, 10–13/6½–8 μ (Fig. 323). *Basidia* 4-spored. *Gill edge* fertile or sometimes partly sterile (especially near edge of cap), cells subcylindric or slightly fusiform 5–8 μ diam.

In grass in fields or in woods: Plodda Falls, Guisachan, 20 Aug. 1955 (type in Herb. Kew); Thetford Heath, Norfolk, 2 Oct. 1958, and elsewhere.

This is *Leptonia sarcita* s. Ricken non Fr. which was renamed *Rhodophyllus sarcitulus* by Kühn. & Romagn. (1953, p. 204 and *RM*, **19** (1954), 38), but without Latin diagnosis on either occasion. It is also *L. sarcita* s. Konrad & Maublanc p.p. and Pearson (these *Trans.* **22** (1938), 31). The Latin diagnosis of *Rhodophyllus sarcitulus* var. *spurcifolius* Kühn. (RM, **19**

(1954), 9) does not validate the specific epithet *sarcitulus*. It remains to be seen whether the sterile gill edge of the variety is sufficiently constant to warrant separation. It is possible that *R. sarcitulus* var. *spurcifolius* may not be different from *R. atromarginatus* but I have not collected enough material to be sure of this. *L. sarcitula* is best recognized by the striate dirty yellowish brown moist cap with darker centre, paler ± smooth stem and gills at first whitish—but, as Kühner states, it is not easy to separate species in this particular section of *Leptonia*. *L. turci* is rather similar in stature and colours but the stem and cap slowly change to dull reddish brown or wine-red some hours after bruising and the colour is perhaps darker and the gill edge is constantly sterile and sometimes darker than the rest of the gill. *L. majuscula* is also similar but darker brown, has rather larger spores, is perhaps more robust and the gills are pale brownish from the start.

LEPTONIA TURCI Bres., *Fungi Tridentini*, I, 47, Pl. 51[1]

This species is not well known and perhaps rather hard to recognize if the striking but slow (taking some hours) colour change of the bruised stem or cap is not noted. It may even be necessary to wait until the following day before being certain of the identification. Amongst the dull brownish species *L. turci* most closely resembles *L. sarcitula*, which besides not changing colour on bruising is more distinctly striate when moist and perhaps the stem is more grey and the gill edge frequently fertile. After some practice it is possible to recognize these two in the field, but not always and it is not easy to put the differences in words. The slow discoloration is the best distinguishing character. My specimens agreed very well with the description and plate in *Fungi Tridentini*, I, but I could not distinguish any smell of meal as given by Bresadola ('odore leviter farinaceo'). Here is a description of British material:

Cap 18–32 mm., convex then expanded often with incurved margin, often slightly umbilicate, *sepia or vandyke* with slightly paler margin and darker blackish brown centre, drying pale sepia, usually with persistently darker centre, striate or not at margin when moist, minutely scaly at first, later becoming smooth but usually remaining scaly at centre, drying radially fibrillose with silky sheen especially round centre, *bruising dull wine-red or reddish brown after handling* (*after some hours*). *Gills* adnate, emarginate or not, *whitish then pale brownish pink*, finally pallid-pinkish, subcrowded, L 22–26 l 3–7, edge concolorous or distinctly darker (pale sepia) in places especially near the cap edge. *Stem* 32–50/1–5 mm., equal or with slightly thickened base, sometimes compressed and channelled, *pallid horn or pale sepia*, sometimes paler below, *slowly turning pinkish or reddish brown in places when bruised or handled* (*after some hours*), smooth or slightly white silky striate, hollow and cartilaginous, base white tomentose. *Flesh* concolorous, drying whitish in centre of cap and stem. *Smell* and *taste* none. *Spores* 10–13/6½–8 μ, ellipsoid-oblong angular. *Basidia* 4-spored. *Gill edge* sterile or with a few fertile basidia here and there, cells clavate or cylindric-clavate, *ca.* 40–50/6–16 μ. Hyphae on cap 6–20 μ diam., with brown vacuolar pigment and deeper brown encrusting pigment masses in places.

MARASMIUS CALOPUS (Pers. ex Fr.) Fr.

(= *Agaricus* (Collybia) *calopus* Pers. ex Fr., *Syst. Mycol.* I (1821), 130; = *M. candidus* [Bolt.] Fr. s. J. Lange non Bolt., Fr., Kühn. & Romagn. and *M. languidus* (Lasch) Fr., s. Kühn. & Romagn. non al,).

There are two interpretations of *M. candidus* in the literature: that of Boudier, adopted by Kühner & Romagnesi (1953) and that of J. Lange. Since the former agrees more closely with *M. candidus* s. Bolton, Fries it is necessary to find another name for that of J. Lange. In the 1948 'List' the name *M. vaillantii* is used for it, but neither the figure quoted by Fries for *vaillantii* (*Vaillant. bot.* Pl. 11, figs. 21–24) nor the description agrees with it. Fries says that *vaillantii* is easily recognized by the broad triquetrous decurrent gills, confirmed by Lundell (*Fungi Suecicae Exsiccati*, XXIII (1942), 26, no. 1158) from a recent collection, so that *vaillantii* must be rejected for J. Lange's agaric, and, in the absence of authentic material and despite Cooke's plate in *Illustrations of British Fungi* (1080 (1126) A), is removed from the British list pending rediscovery. Kühner & Romagnesi have used the name *M. languidus* (Lasch) Fr. for J. Lange's agaric; *languidus* was, however, described by Lasch (*Linnaea*, **3** (1828), 385) as being pallid in all parts, the stem turning grey at the base and the cap 'subtomentosus'. This, too, seems to me not to fit J. Lange's agaric which always has a reddish brown stem. There is, however, a more convincing earlier name available, namely, *M. calopus*. This is described by Fries as being similar to *M. scorodonius* but inodorous, the stem 'glabro, badio-rubro', and the habitat 'in graminosis, fagetis alibique'. Furthermore, in *Epicrisis* (1838), 379, he quotes Bulliard, Pl. 550, fig. 1, for *M. calopus*. Now this plate depicts *Agaricus fibulus* (and is indeed quoted by Fries for *A. fibulus*) but it also has in the top right-hand corner a group of agarics growing on a twig (all the others are shown growing on soil) which are recognizably like J. Lange's agaric.

There are also two other names with a recognizable quoted plate which seem to be referable to it:

Agaricus angulatus Pers. ex Pers., *Mycol. Europ.* III (1828), 155, Pl. 26, figs. 3–4; since Fries did not include *angulatus* in the *Systema*, 1821, however, J. Lange's agaric is included in the 'Check List' under the earlier name *calopus* with *M. angulatus* (Pers. ex Pers.) Fr. as a synonym; Cke 1080 (1126) B, *angulatus* depicts material growing on rushes, such as I have gathered personally, which is microscopically similar to *calopus* from drier situations and differs only in having a more swollen and more often tomentose mealy stem base.

M. insititius Fr., 1838, s. Fries, Rea vix Cooke, which is of later origin, need not be discussed in detail.

M. candidus [Bolt.] Fr. s. Fries, Boudier, Kühn. & Romagn. differs from *M. calopus* in being entirely white at first but often discolouring cream, especially the gills, the stem most often (but not always) turning greyish or blackish from the base; it is entirely pruinose when fresh and has longer lanceolate spores, 10–14(16)/4–5 μ, from 4-spored basidia. I collected it in large quantities at Rousdon, Devon, 18 July 1959, growing on bramble and other herbaceous debris, some collections of which were so like the plate of Boudier that they might have been the specimens depicted by him.

MARASMIUS SACCHARINUS ([Batsch) Fr.] Fr. (Fig. 434)

(= *Agaricus* (*Mycena*) *pterigenus* β *A. saccharinus* [Batsch] Fr., *Syst. Mycol.* 1 (1821), 160)

Some years ago I found one specimen of a very puzzling little agaric, which completely baffled me at first. After making a description it seemed likely to be a *Marasmius* on account of the peculiar cells on the gill edge. Whilst searching through the literature I came across the Bresadola plate of *M. saccharinus* and immediately recognized my agaric. I then found that Cke 1087 (1136) C of *M. saccharinus* also suggested it. I have therefore reinstated this name in the 'List' and give below a brief description of my specimen. Quélet (1872) described a different agaric under this name but altered it to *M. recubans* the following year.

Cap 9 mm., expanded slightly umbonate, *white*, pellucidly striate at margin when moist, drying out matt. *Gills* free, *white*, distant, L 16 l 1, rather thick, ventricose, edge even. *Stem* 9/1½ mm., slightly swollen above base, *white above*, *pale tawny-rusty at base*, scattered white pruinose under lens, hollow. *Flesh* concolorous (rusty-tawny in stem base). *Smell* slightly acid. *Spores ellipsoid-amygdaliform*, $5\frac{1}{2}$–7/3–4 μ. *Basidia* 4-spored, *ca.* 30/5–6 μ. *Gill edge* with irregularly-shaped clavate cells often with one or more diverticula 20–24/5–6 μ (Fig. 434). Similar cells on stem and apparently on cap. Clamps present.

In beech leaves, Boxhill, Surrey, 19 Nov. 1954.

MARASMIUS TORQUESCENS Quél. *Champignons du Jura et Vosges*, 1 (1872), 198, Pl. 22, fig. 3

I have retained this name in the 'List' in addition to *M. lupuletorum* because I believe them to be distinct. I have on a few occasions found, always on twigs of beech or other deciduous trees but not so far among beech leaves, a small *Marasmius* which under the lens can be seen to have brown hairs on the stem and sometimes also on the cap; under the microscope a scalp off the cap has always shown brown hairs similar to those on the stem. On the cap of the agaric known to me as *M. lupuletorum*, which I have always found on beech leaves or in beech litter, and which Pearson (1943) recorded as having cap 'glabrous', I have found no such hairs. Furthermore, the cap of *M. torquescens* was always 5–10 mm. diam., whereas *M. lupuletorum* was larger, the cap being 12–35 mm. diam. and the stem darker bay at the base. The small agaric I call *M. torquescens* was excellently described under this name by Josserand (BSMF, **49** (1933), 218), but later (**71** (1955), 83–87), he argued that *M. lupuletorum* s. Konrad & Maublanc and J. Lange and others is the same. With all respect to this distinguished mycologist I should like to suggest that even if *M. lupuletorum* s. Konrad & Maublanc, J. Lange, from beech woods does have sparse brown hairs on the cap, the habitat, size, more numerous brown hairs on the cap, and the more obviously brown-dotted stem in *torquescens* and brighter red-brown stem in *lupuletorum* are sufficiently diagnostic to justify separation of these two species at the present time. I agree, however, with Josserand that *M. lupuletorum* s. Bres. is most likely another species.

M. torquescens	*M. lupuletorum*
Cap 5–10 mm., pale date-brown or dirty ochraceous at centre, paler dirty cream at margin, sulcate-striate when moist, sometimes minutely pruinose under lens	*Cap* 12–35 mm., greyish buff or dirty ochraceous with darker centre, sometimes drying slightly pinkish, sulcate-striate at edge when moist, apparently smooth but matt
Gills distant, L 11–13 l (0)–1, very pale brownish-white	*Gills* distant, L *ca.* 14–18 l 1–3, creamy white
Stem 13–40/0·5–1 mm., dull date-brown with paler apex, entirely velvety-pruinose, sometimes appearing brown-dotted under lens	*Stem* 30–80/1½–2 mm., pale brownish or creamy at apex, date-brown in middle, bay or black-brown at base, velvety-pruinose (whitish under lens)
Spores 8–9½/3½–4 μ, ellipsoid-oblong with large oblique apiculus	*Spores* 7½–10/3½–4½ μ, similar shape
Cystidia on gills none	*Cystidia on gills* none
Cystidia on stem setulose, often forked or trifid at apex, brownish sub micr., 60–80/4–5 μ at base, apex 1–2 μ	*Cystidia on stem* similar, 50–100/6–8 μ at base, apex 1–3 μ
Cystidia on cap numerous, setulose 50–80/3–4 μ apex ½–1 μ, brownish sub micr. (Fig. 437)	*Cystidia on cap* none seen
Habitat on twigs or woody stems	Habitat in beech leaves or beech litter, more rarely in oak leaves

Mycena angustispora sp.nov. (Fig. 439)

Pileus 1–3(15) mm., e convexo papillato vel leviter umbonato expansus interdum leviter umbilicatus, pure albus senectute leviter decolorans, jove pluvio striatus, jove sicco interdum sulcatus, primo minutissime pubescens dein glaber apparens, ad marginem juventute leviter involutus. Lamellae arcuato-decurrentes vel adnatae dente decurrentes, angustae, albae, distantes, L 5–9 l 0–1(3), rariore prope marginem pilei furcatae. Stipes 5–15(25)/0·2–0·5(1) mm., aequalis, pure albus senectute albidus vel praecipue ad basim luteolo-tinctus, juventute minute pubescens, ad basim vulgo albo- vel albido-strigosus. Sporae fusiformes vel cylindrico-fusiformes, 8–10/2½–3 μ, non-amyloideae. Basidia 4-sporigera, ca. 20–22/5–6 μ. Cystidia aciei lamellarum non visi. Pili pilei flagelliformes anguste lageniformes ad apicem acuti interdum ad basim aliquantum crasso-tunicati 40–70(100)/4–10 μ ad basim, vulgo supra flexuosi (Fig. 439). Pili stipitis similes 50–100/4–8 μ ad basim.

Inter folias deciduas vel ad pericarpia vel ad ramulos Fagi, vulgo sub foliis occultus; Mickleham Downs, Surrey, 24 Nov. 1953 (typus in Herb. Kew.). A pilis flagelliformibus pilei stipitisque et sporis angustis fusiformibus insignis.

Cap 1–3(15 sec Josserand) mm., convex papillate or slightly umbonate then expanded, sometimes slightly umbilicate, *pure white discolouring slightly with age*, striate when moist, sometimes sulcate when dry, very minutely pubescent at first then appearing ± smooth, margin often slightly involute when young. *Gills arcuate-decurrent or adnate with tooth*, narrow, white, *distant*, L 5–9 l 0–1(3), rarely forked near edge of cap. *Stem* 5–15/0·2–0·5 mm. (< 25/1 mm. sec Josserand), ± equal, *pure white becoming slightly whitish or tinged yellow-brown with age* (especially at base), minutely pubescent when fresh, base often white or whitish strigose. *Spores fusiform or cylindric-fusiform*, 8–10/2½–3½ μ, non-amyloid. *Basidia* 4-spored, *ca.* 20–22/5–6 μ. No *cystidia* seen on gills. Hairs on cap *acutely* *pointed narrowly lageniform or flagellate*, sometimes rather thick-walled at base, 40–70(100)/4–10 μ at base, often flexuose above (Fig. 439). *Stem* hairs similar, 50–100/4–8 μ at base. Long branching thick-walled brown clamped hyphae 5–6 μ diam. may be present at base of stem, cells *ca.* 70–200 μ long.

In deciduous leaves or on beech nuts or small beech twigs, often buried under leaves. Mickleham Downs, 24 Nov. 1953 (type in Herb. Kew). Readily distinguished by pointed hairs, often rather thick-walled at the base, on cap and stem and narrow fusiform spores. Despite consistently smaller stature I am sure this is the same as *Omphalia angustispora* (*Ann. Soc. linn. Lyon*, **80** (1936), 81) described by Josserand without Latin diagnosis.

MYCENA BELLIAE (Johnston) P. D. Orton (see p. 178 and Fig. 438)

Whilst investigating the marshes at Surlingham, Norfolk, in 1956 I collected large quantities of this agaric after having been shown where to find it by E. A. Ellis. The cap with separable viscid pellicle, amyloid spores, marginal cystidia, mouldy-rank smell and the tendency to turn red-brown are characters suggesting sect. GLUTINIPEDES of *Mycena*, hence the transfer. I think it resembles *M. viscosa* most closely but it is nevertheless a rather isolated species, perhaps on account of the unusual habitat. Here is a description of my collections:

Cap 6–24 mm., convex soon umbilicate, finally expanded-depressed, *sepia or sepia-horn fading to pale horn or whitish*, viscid and striate to disk when moist, margin white pruinose when young then smooth and often slightly crenate, *viscid pellicle tough and separable. Gills deeply arcuate-decurrent*, usually rather narrow, *white or whitish*, rather distant, L 14–18 l 1(3), sometimes slightly interveined in larger specimens especially towards cap margin, edge even. *Stem* 30–65/1–3 mm., equal or slightly swollen at base, *hyaline-whitish, soon discoloured reddish brown from base up*, occasionally also at apex, at first entirely minutely white silky-floccose, then becoming smooth except sometimes at apex, hollow, base white strigose-tomentose. *Flesh* concolorous, very thin. *Smell* peculiar, mouldy-rank. *Spores* elongate ellipsoid-oblong sometimes slightly depressed on one side, *11–14/5–6* μ, *amyloid. Basidia* 4-spored, 40–48/7–8 μ. *Gill edge* fertile at first *soon sterile* with numerous lageniform cells, apex variable in shape, sometimes acute or forked near tip, sometimes obtuse or capitate, 40–50/8–14 μ (Fig. 438). *Facial cystidia* absent. Hyphae of cap cuticle filamentous 6–14 μ diam. with a layer of narrower hyphae 1–2 μ diam. over these.

Singly or in twos and threes on stems of *Phragmites* just above water level, Thack Marsh, Surlingham, Norfolk, 21 Oct. 1956. Appears only to grow on those reed stems normally in standing water and with the stem base of the fungus just at or above water-level. The whole fungus tends to turn reddish brown in places with age, thus reminding one of *M. viscosa.*

Mycena lactella sp.nov. (Figs. 137, 138, 324, 440, 441)

Pileus 2–7 mm., e conico vel conico-convexo expansus, obtuse umbonatus vel papillatus, albus, jove pluvio ad marginem striatus, jove sicco minute sericeo-atomatus, et ad marginem leviter radialiter plicatus vel sulcatus. Lamellae adnatae, angustae, albae, subconfertae, L 10–16 l 1–3. Stipes 4–12/0·2–0·5 mm., brevis, ± aequalis, albus, saepe flexuosus vel incurvatus, sub lente minutissime albo-pruinosus, ad basim albo-tomentosus vel leviter strigosus. Odor nullus. Sporae elongato-fusiforme-lanceolatae, 7–10/2¼–3¼ μ (Fig. 324), non-amyloideae. Basidia 2-sporigera, 20–24/5–6 μ, sterigmatibus 4–6 μ longis. Cystidia aciei lamellarum plurimum subcapitata sed interdum aliquantum acuta, vel infra leviter incrassata, 24–30/4–6 μ ad apicem 3–6 μ lata (Fig. 440). Cystidia faciei lamellarum nulla. Cellulae pruinae stipitis fere cylindricae leviter flexuosae interdum ad apicem incrassatae, ca. 18–36/1–1½ μ, ad apicem 1–2 μ latae (Fig. 441 *a*); cellulae cuticulae pilei similes 10–40/1–2 μ, ad apicem 1–4 μ latae (Fig. 441 *b*).

Ad acus pini, Freshfield, Lancs, 13 Nov. 1958 (typus in Herb. Kew.). A M. lactea stipite breviore, statura minore, cellulis pruinae stipitis angustioribus et sporis leviter angustioribus differt.

Cap 2–7 mm., conical or conico-convex then expanded, obtusely umbonate or papillate, *white*, striate at margin when moist, minutely silky-atomate when dry, slightly radially plicate or sulcate at margin. *Gills* adnate, narrow, *white*, subcrowded, L 10–16 l 1–3. *Stem* 4–12/0·2–0·5 mm., short, ± equal, often flexuose or incurved, *white*, *very minutely white pruinose under lens*, base white tomentose or slightly strigose. *Smell* none. *Spores elongate-fusiform-lanceolate*, 7–10/2¼–3¼ μ (Fig. 324), non-amyloid. *Basidia 2-spored*, 20–24/5–6 μ, sterigmata 4–6 μ long. *Marginal cystidia* mostly subcapitate but sometimes rather pointed, sometimes also slightly swollen below, 24–30/4–6 μ, apex 3–6 μ (Fig. 440). No *facial cystidia* seen. Cells of pruina on stem ± cylindric, slightly flexuose, apex sometimes swollen, *ca. 18–36/1–1½ μ, apex 1–2 μ* (Fig. 441 *a*); similar cells on cap, *10–40/1–2 μ, apex 1–4 μ* (Fig. 441 *b*).

On pine needles, Freshfield, 13 Nov. 1958 (type in Herb. Kew).

Differs from *M. lactea* in the shorter stem, smaller size, narrower hairs on cap and stem, fewer gills reaching stem and slightly narrower spores. This seems to be a 2-spored form of *M. lactea* var. *minor* Kühner, 1938, but I have described it as a species since it was recognizably distinct in the field at the one place at Freshfield where it grew separately from *M. lactea*, present in the vicinity. Further studies are necessary to show whether this is a 'small' *M. lactea* (if so, it should be reduced to a synonym and not retained as a variety) or whether its rank as a distinct species is justified, which I think more probable from field observations.

Mycena tortuosa sp.nov. (Figs. 139–142, 325, 442–444)

Fungus totus albus dein senectute eburneo vel cremeo tinctus. Pileus 1–8 mm., e convexo vel conico-convexo expansus vel leviter depressus, jove pluvio leviter pellucido-striatus vulgo ad marginem guttis aquae obtectus, jove sicco opacus, sub lente minute pubescens, ad marginem vulgo lamellas excedens, diu involutus vel minute crenulatus. Lamellae adnatae vel liberae, angustae, subconfertae vel subdistantes, L 12–20 l 1–3(7), ad aciem integrae vel sub lente flocculoso-denticulatae. Stipes 1–27/0·1–1 mm., aut brevissimus et interdum excentricus aut longior interdum flexuosus, aequalis vel ad basim vel ad apicem leviter incrassatus, sub lente totus minute pubescens, jove pluvio guttis aquae obtectus, interdum ad basim mycelio breviter radicante terminatus. Odor nullus. Sporae elongato-fusiforme-lanceolatae, 7–11/2¼–3½ μ (Fig. 325), non-amyloideae. Basidia 2- vel 4-sporigera, 16–20/4½–6 μ. Cystidia aciei lamellarum acute lanceolato-fusiformia vel lageniformia 14–24/4–6(8) μ (Fig. 443). Cystidia faciei lamellarum nulla. Pili stipitis pileique vulgo clavato-capitati, infra tortuosi, rariore flexuoso-cylindrici, ad apicem interdum plane capitati; pili pilei 20–60/3–4 μ, capitulis 6–10/5–8 μ, pili stipitis 36–100/2–4(6) μ, capitulis 4–8 μ latis (Figs. 442, 444).

Semper in locis humidis, ad ramulos, ligna putrescentia, etc., saepe gregarius. Ad ramulos Alni: Goodworthy Thicket, Membury, Devon, 1 Nov. 1956 (typus in Herb. Kew.); Horner Water, Porlock, Somerset, 25 May 1957 (legit P. K. C. Austwick); Tuck's Drive, Surlingham, Norfolk, 19 Oct. 1957; Holwell Wood, Enmore, Somerset, 21 Nov. 1957; ad ramulos Fraxini copiosissimus, The Landslip, Rousdon, Devon, 29 Nov. 1958. Pilis tortuosis stipitis pileique, cystidiis aciei lamellarum acutis et habitatione in locis humidis maxime insignis. Conspectu M. lacteae sed a characteribus microscopicis et habitatione facile distinguitur.

Whole fungus pure white discolouring slightly ivory or cream when old. *Cap* 1–8 mm., convex or slightly conico-convex soon expanded ± plane or slightly depressed, slightly pellucid-striate when moist, matt when dry, *minutely pubescent under lens, the hairs often holding drops of water in moist conditions*, margin often slightly exceeding gills and involute for some time, sometimes minutely crenulate. *Gills* adnate, sometimes with slight tooth, to free, narrow, subcrowded, L 12–20 l 1–3(7), sometimes crisped in larger specimens, edge even or minutely flocculose-denticulate under lens. *Stem* 1–27/0·1–1 mm., very short and sometimes excentric (when growing on the underside of bark lying on the ground, etc.) or longer and central, sometimes flexuose, equal or slightly swollen at base or apex, entirely *minutely pubescent under lens, hairs often holding drops of water in moist situations*, sometimes with short filmy mycelial strands at base. *Smell* none. *Spores elongate-fusiform-lanceolate*, 7–11/2¼–3½ μ (Fig. 325), non-amyloid. *Basidia* 2- or 4-spored, 16–20/4½–6 μ. *Marginal cystidia acutely lanceolate-fusiform or lageniform*, 14–24/4–6(8) μ (Fig. 443). *Facial cystidia* absent. Hairs on cap and stem similar, mostly clavate-capitate with the *lower part spirally twisted and apex sometimes flattened-capitate*, a few cylindric-flexuose and sometimes slightly swollen below; those on cap 20–60/3–4 μ with capitula 6–10/5–8 μ, those on stem 36–100/2–4(6) μ with capitula 4–8 μ diam. (Figs. 442, 444).

Always in damp situations, often gregarious on the underside of fallen logs, bits of bark, twigs, etc., especially on alder but also on ash, elder, fir and probably others in suitable situations. On alder debris, Goodworthy Thicket, Membury, 1 Nov. 1956 (type in Herb. Kew); Horner Water, Porlock, 25 May 1957 (legit P. K. C. Austwick); Tuck's Drive, Surlingham, 19 Oct. 1957; on fir and alder, Holwell Wood, Enmore, 21 Nov. 1957; in great quantity especially on ash, The Landslip, Rousdon, 29 Nov. 1958. Superficially resembling *M. lactea* this characteristic species differs in the corkscrew-shaped hairs on cap and stem often holding drops of water, small acute marginal cystidia and habitat. *M. cephalotricha* (Joss.) Kühner has similar hairs on cap and stem but differs in the shorter, navicular spores 6½–8½/4–5½ μ, and obtuse marginal cystidia and is found on oak leaves, but has not yet been found in Britain. *M. tortuosa* is perhaps commoner in the west of Britain than in the east but certainly widely distributed and probably overlooked on account of its habitat.

NAUCORIA

Emended diagnosis (for discussion on the limits of this genus see p. 169).

Spore print buff to snuff- or cigar-brown (never ochre or rusty); cap cuticle cellular or heterocellular (i.e. cells of various shapes from subglobose to sausage-shaped or broadly cylindrical when seen from above) sometimes with a thin layer of filamentous hyphae over these or with ± erect clavate cells projecting through them, rarely entirely filamentous; spores smooth or rough without or more rarely with distinct germ pore (so far only in *N. stagnina*, *stagninoides* and *zetlandica*); marginal cystidia always present, shapes various; facial cystidia absent; mostly small fungi with cap 5–30 mm., rarely up to 55 mm., hygrophanous; gills usually whitish or pale-clay then deep buff or snuff-brown, in the redder-brown species sometimes coloured like the cap. Type species—*N. escharoides* (Fr. ex Fr.) Kummer.

I have for some time suspected that two different species have been included within the epithet *stagnina*. *Agaricus* (Galera) *stagninus* Fr., *Syst. Mycol.* I (1821), 268, I take to be the slightly more robust fungus with ± decurrent often triangular gills described by Kühner in *Galera* (1935), p. 187; it is not uncommon in Britain in sphagnum, especially on moors but found always over about 1000 ft. above sea-level so far. This seems to me to agree best with 'pileo hemisphaerico obtusissimo badio-ferrugineo expallente, circa marginem squamoso, stipite longe rubiginoso' also 'stipes subspadiceus' and especially 'lamellis decurrentibus' and 'lam. pileo concolores latissimae triquetrae' in the original diagnosis. The cap is said to be 'humidus'. The rather more slender one, figured by Fries (129^2) as 'forma tenuis' (though possibly a mixture, at least the right-hand specimens look more slender and one does have ventricose gills) has the gills adnate sometimes with a tooth, but usually ± ventricose and is described below as a new species, *N. zetlandica*. When I first collected this in the Shetlands I did not think of *stagnina* at all in the field, but the second collection from Herefordshire was more like *stagnina* and immediately reminded me of Fries's plate. I also at first thought with some doubt that this was *stagnina* as described by M. Lange in *Greenland Agaricales*, **3** (1957), 65. After studying the Herefordshire collection and a further perusal of literature I am more convinced of this on account of the microscopic details given, especially the narrow subgelatinized hyphae on the cap and the spore details. Fortunately there is a spore difference to help distinguish these two, the spores of *stagnina* s. Kühner being relatively longer and narrower, whereas those of *zetlandica* are mostly shorter and broader although the overall dimensions are only slightly different (see Figs. 336, 337). Both collections of *zetlandica* were from under 500 ft. above sea-level, which agrees with Fries's statement in the description accompanying Pl. 129^2 'forma major lecta in regionibus montanis... forma tenuis in campestribus Upsaliae'.

Before using the following provisional key to the species of *Naucoria* recorded from Britain or likely to be found, it is useful to have details of spores from a spore print ('spores smooth' or 'rough' means sub immers. but it is often possible to see the roughness with lower magnification) and of marginal cystidia and cap cuticle from thin scalp from cap taken near the centre; sequence of colour changes when drying out or through age; and habitat. Additional careful field work is needed on this genus to solve certain problems, such as the status of *N. celluloderma* and *N. alnetorum*.

Key to Naucoria

1. Stem very short, often curved, central or excentric, 2–8/½–1½ mm., minutely atomate or velvety pruinose; basidia 2-spored; spores smooth, broadly ellipsoid-ovoid, 8–10/5–6 μ; cap 4–12 mm., pale or dirty olive or date-brown tinged olive, minutely velvety pruinose, often atomate or silky-atomate when dry (minute glistening points); marginal cystidia cylindric-flexuose capitate, 18–40/3–6 μ, apex (4)5–8 μ; similar cells on cap projecting through sausage- or barrel-shaped cells, 24–50/8–24 μ, together with some filamentous often encrusted pigmented hyphae 4–8 μ diam.; on twigs and dead stems of various plants *rubi*

1. Not so (stem nearly always central and longer, rarely less than 10 mm. long, if very short basidia 4-spored or other characters different) 2

2. Spores phaseoliform or ellipsoid-ovoid, smooth, 6–10(11)/4–6 μ; colours often olivaceous; two species growing on wood, one in *Carex* debris 3

2. Spores ellipsoid, amygdaliform or limoniform, slightly phaseoliform only in *stagnina* when they are 13–16 μ long, often more than 10 μ, never less than 8 μ long; colours rarely olivaceous; habitats various, rarely on wood 5

3. Growing on *Carex* debris (also *Molinia* sec Favre); cap smooth (cuticle cellular), striate to centre when moist, dull honey, sometimes with slight olivaceous tinge which may be more marked towards margin or darker sepia-honey at centre, 8–13 mm.; spores 6½–9/4–6 μ; stem 18–40/0·7–2 mm., pale dirty olivaceous or colour of cap, pruinose at apex only; marginal cystidia clavate, sometimes flexuose below, 30–62/3–4 μ, apex 7–15 μ; cells of cap cuticle clavate or pyriform, sometimes with long stalks, *ca.* 25–40/8–25(30) μ *laevigata*

(First British record, Buxton Heath, Hevingham, Norfolk, 3 July, 1959, legit E. A. Ellis)

3. Growing on wood; cap smooth or velvety pruinose, at least under lens, distinctly olive when young and fresh, fading when old or dry 4

4. Spores 6–8/4–5 μ; cap small, 4–25 mm., striate at least at margin when moist, olive then olivaceous or dull honey, sometimes buff when dry; stem (4)10–32/½–2 mm.; marginal cystidia ± cylindric sometimes slightly swollen below or subcapitate, 26–68/4–6 μ, apex 3–6 μ or clavate-capitate, apex 5–14 μ diam.; smell none or faint pleasant; on logs and twigs of various trees *centunculus*

4. Spores (7)7½–10(11)/(4)4½–5½ μ (Fig. 397); cap small to medium, 10–40 mm., not or scarcely striate when moist, olive to olivaceous-honey, often date-brown when old, or drying with a tawny tinge in centre; stem 10–40/1½–6 mm.; marginal cystidia cylindric, often flexuose or slightly swollen below, sometimes capitate to lageniform, 38–70/5–10 μ, apex (4)6–14(18) μ; smell sometimes strong pleasant aromatic; on deciduous logs and stumps (beech, oak and ash so far) *sumptuosa*

5. Spores ellipsoid, smooth sub immers., with or without visible germ pore, 11–16/7–9(9½) μ (Figs. 334, 336, 337); growing on *Sphagnum* or on mossy peat 6

5. Spores ellipsoid-amygdaliform, amygdaliform or limoniform, smooth or rough sub immers., sizes various, without visible germ pore; habitats various (only *N. sphagneti* on *Sphagnum*, § 16, also *cephalescens* occasionally, § 20) 8

6. Growing on *Sphagnum*, stem with white veil forming conspicuous rather persistent ring-zone or scales on upper stem; cap striate when moist, tawny red-brown to chocolate or almost chestnut, with fragments of veil at edge at first; subviscid or not when moist; basidia normal size, 36–44/9–11 μ 7

6. Growing on mossy peat; stem with fugacious white veil visible only when very young; cap when moist not striate or viscid, dark vandyke or blackish-chocolate; basidia unusually large, 46–52/12–14 μ; marginal cystidia rather narrowly lageniform often with flexuose neck, more rarely ± cylindrical, 30–66/4–10 μ, apex 4–7 μ; spores 12–15/8–9 μ always rather rounded with visible germ pore (Fig. 334); so far collected only in the Shetlands *stagninoides*

7. Spores 13–16/7½–9 μ with small but fairly distinct germ pore (Fig. 337); gills broadly adnate or subdecurrent, arcuate triangular, more rarely very slightly ventricose; cap soon plane or slightly depressed; stem 45–120/1½–6 mm., date-brown or reddish umber, soon blackish chocolate or dark bay at least in lower part; cap 12–28 mm., pale to deep reddish umber or chocolate, when moist not viscid and striate at margin only; marginal cystidia variable, cylindric to lageniform or clavate-capitate, 40–80/6–20 μ, apex 4–10 μ; usually (? always) above 1000 ft. above sea level *stagnina*

7. Spores 11–15/7–9(9½) μ, without visible or with indistinct germ pore (Fig. 336); gills adnate, sometimes with tooth usually ± ventricose; cap convex then expanded convex, sometimes slightly umbonate, more rarely becoming plane or slightly depressed; stem 50–135/1–3 mm. (< 7 at base) honey or tawny-honey, sometimes becoming bay or vandyke in lower part; cap 10–25 mm., tawny date-brown to deep tawny-honey or burnt sienna, when moist subviscid and striate to centre; marginal cystidia 36–82/5–20 (28) μ, apex 4–16(20) μ, variable, cylindric, lageniform or clavate-capitate; so far collected below 500 ft. above sea-level *zetlandica*

8. Marginal cystidia lageniform with long rather pointed narrow neck (*Urtica* hair-shaped)—apex 1–2(6) μ diam., sometimes with small capitulum (as in Fig. 457); cap cuticle heterocellular **9**

8. Marginal cystidia cylindric-flexuose, clavate or capitate or lageniform with broad neck and obtuse apex 4–22 μ (as in Figs. 445, 453); cap cuticle heterocellular (as in Fig. 452) or cellular **17**

Species of sect. Alnicola *with marginal cystidia ± acute at apex* (Urtica-*hair shape*)

9. Moist cap pale yellowish, pale ochraceous, buff or milky coffee colour, sometimes darker date-brown at centre, without distinct reddish brown tints; under alders; basidia 4-spored **10**

9. Moist cap predominantly reddish brown (tawny-rusty, date-brown, dull reddish brown, umber or bay); habitats various; basidia 2- or 4-spored **12**

10. Spores 8½–12/4½–5½ μ (Fig. 332), amygdaliform-limoniform, punctate; cap 7–32 mm., with darker central spot at first, date-brown in centre with yellowish buff margin or entirely date-brown when old, pale dirty buff or slightly yellowish when dry, strongly striate to centre when moist; taste mild; stem with fugacious pale yellowish flocci from veil at first, 28–75/1–3 mm., soon sepia or vandyke from base up, finally entirely dark vandyke *striatula*

10. Spores (9)10–14/5–6½ μ (as in Fig. 333), limoniform, rough (Fig. 337); cap 7–40 mm., entirely buff or dirty ochraceous, not or only slightly striate when moist; taste *either* bitter, sometimes only slightly so, *or* rather radishy; stem with or without veil remnants, 15–50/1–4(7) mm., pallid buff often becoming darker from base up **11**

11. Cap at first pale dirty whitish then entirely minutely clay-whitish or yellowish buff, scurfy or fibrillose, especially near margin, not or only slightly striate when moist, 10–20(30) mm.; veil conspicuously appendiculate at first; stem with well-marked yellowish buff or clay-whitish veil forming ring-zone and scattered patches below (best seen on young specimens), 25–50/1½–3 mm. *luteolofibrillosa*

(First British record, Gannochy, Glenesk, Kincardine-shire, 4 Sept. 1952)

11. Cap pale yellowish or buff, slightly adpressed fibrillose at first, often soon ± smooth and matt, not striate when moist, 7–40 mm.; veil traces none or slight and fugacious when young; stem apex pruinose or with fugacious traces of veil then whitish silky-striate, 15–40/1–4(7) mm. *escharoides*

12. Smell slight but fruity (ripe pears); taste mild; spores 8½–10/4½–5½ μ, fusiform or ovoid-amygdaliform; under alders; cap 20–35 mm., dark brown, furfuraceous-scaly; stem 35–80/2–5 mm., dark tawny-brown with pallid silky-fibrillose veil (*N. suavis* Bres., no British record, see Bres. 802)

12. Smell none or faint fungussy; taste mild or bitter; if under alders spores 10–14/5–6 μ, amygdaliform or limoniform, rough; other species on burnt ground, in sphagnum or on peaty soil **13**

13. Spores (9) 10–14/5–6½ μ (as in Fig. 330), amygdaliform or sublimoniform, ± rough; under alders or on peaty soil; stem with or without veil **14**

13. Spores (7½) 8–10 (12)/4½–6 μ (Fig. 329 *a*, *b*), ellipsoid-amygdaliform or fusiform, smooth or punctate; on burnt ground or in sphagnum; stem with fibrillose veil at least when young; if spores 8½–12/4½–5½ μ (as in Fig. 332) and growing under alders, see *striatula*, § 10 **16**

14. Growing on peaty soil under birch and *Molinia*; taste distinctly bitter; cap 18–42 mm., not striate when moist; stem 40–60/2½–5 mm., attenuated downwards, dark honey then cap colour from base up, veil none or slight; cap convex truncate or broadly umbonate then expanded broadly umbonate, reddish bay drying paler; marginal cystidia 35–52/7–10 μ
(*Alnicola scolecina* var. *fellea* Favre HM, 133, fig. 56, no British record)

14. Growing under alders; taste mild or slightly bitterish; cap 6–30 mm., generally striate at least at margin when moist **15**

15. Stem without veil traces, 30–50/1–5 mm., concolorous or darker below, slightly white silky fibrillose striate; cap smooth, striate when moist, umber, reddish bay or date-brown drying tan with slight yellowish tinge; taste mild; marginal cystidia 40–60/8–10 μ, apex 2–4 μ *scolecina*

15. Stem with whitish, pale ochraceous or pallid fibrillose patches or ring-zone from veil, 22–80/1–3 mm., concolorous or paler at apex; cap entirely minutely silky-scurfy or whitish or pallid-ochraceous fibrillose-scaly, generally slightly striate at margin when moist, dull reddish date-brown or reddish brown drying paler often with tawny tinge at centre; taste mild or bitterish; marginal cystidia 30–60/4–7 μ, apex 1–2 (3) μ more rarely subcapitate < 6 μ; spores (9) 10–12½/5–6 μ (Fig. 330) *subconspersa*

16. Growing on burnt ground; taste very bitter; cap 12–33 mm., smooth and ± shiny (or slightly minutely pruinose when young), striate at edge when moist, tawny-rusty, tawny-bay or deep date-brown, only slightly hygrophanous; spores 8–10 (12)/4½–5 (6) μ (Fig. 329 *b*), ellipsoid-amygdaliform or fusiform, minutely punctate; marginal cystidia 30–50/5–9 μ *amarescens*

16. Growing in (or near) sphagnum; taste mild or slightly oily-rancid; cap 8–27 mm., entirely pale ochraceous or yellowish fibrillose-scaly or scurfy or almost smooth at centre, date-brown, pale umber or bay, not striate at edge when moist; stem 32–65/1½–2½ mm., concolorous or slightly paler at apex then darker brown from base up; spores (7½) 8–10/5–6 μ (Fig. 329 *a*), ellipsoid-amygdaliform, smooth or very faintly punctate sub immers. (Fig. 329 *a*); marginal cystidia 30–56/6–14 μ *sphagneti*

Species of sect. Alnicola *with marginal cystidia obtuse at apex, clavate or capitate*

17. Cap olive or olivaceous, smooth, striate; spores sublimoniform, smooth, 8½–10/4–5 μ; stem 10–40/0·7–2 mm., minutely white pruinose under lens; marginal cystidia cylindric-clavate, *ca.* 30/5 μ; growing on soil in woods
(*N. reducta* (Fr. ex Fr.) Sacc.—no authentic British record, see L 124 D)

17. Not so (colours rarely slightly olivaceous, if so spores larger or other characters different) **18**

18. Growing on burnt ground; taste bitter; spores 8–11/4½–5½ μ, ellipsoid-amygdaliform, faintly punctate; cap 12–20 mm., when moist ochre-yellow or ochraceous-amber and slightly viscid, not or scarcely striate; stem 25–40/1½–3 mm., white or whitish then pallid, minutely silky striate; marginal cystidia capitate or cylindric-clavate, sometimes slightly swollen below, 20–40/2–4 (5) μ, apex 4–8 (10) μ; cap cuticle with thin layer of filamentous hyphae 2–4 μ diam. over shorter broader cells *ca.* 10–20 μ diam. *pseudoamarescens*
(First British record, Juniper Hill, Mickleham, 24 June 1956)

18. On peaty soil, in sphagnum, in swamps under willows or under alders; taste none or mealy, or with slight bitterish after-taste; spores often larger **19**

19. Spores smooth sub immers. ellipsoid-amygdaliform (9)10–12(13)/5–6 μ (Figs. 326, 327); basidia 4-spored; moist cap date-brown-tawny with brighter yellowish margin, tawny-honey, date-brown or vandyke; on peaty soil (? always) near willows; taste mealy; small; cap 4–15(18), stem 7–30/½–2 mm.; gills with yellowish or ochraceous tinge at first; cap cuticle heterocellular **20**

19. Spores rarely smooth, sizes various, often larger; cap usually duller coloured; taste mealy only in *N. alnetorum* (which has spores 13–16(20)/6–8 μ and basidia 2-spored and grows under alders), otherwise taste none or with bitterish or radishy after-taste **21**

20. Marginal cystidia variable, 22–64/4–10 μ, lageniform with narrow apex (2–5 μ) to cylindric-flexuose, often swollen below and subcapitate (apex 5–10 μ), but some with large globose or slightly oval often rather thick-walled head 10–22(28) μ diam. (Fig. 453); moist cap tawny-honey or date-brown-tawny with brighter yellowish margin; stem pale yellowish or pallid then tinged honey from base up *cephalescens*

20. Marginal cystidia cylindric-flexuose, often swollen below or ± capitate 22–56/4–6 μ, but with smaller head 3–8(11) μ diam. (Fig. 451); moist cap tawny-honey, date-brown, sepia or vandyke sometimes with slight yellowish tinge at margin, sometimes minutely cracked-scaly when dry; stem pallid ochraceous or pale date-brown then often tinged sepia from the base up *permixta*

21. Marginal cystidia cylindric-flexuose with large head 50–65/4–5 μ, apex 8–12(14) μ; cap cuticle with dermatocystidia like those on the gill edge; spores 10–14/6–7 μ, amygdaliform, rough; basidia 4-spored; cap 7–10 mm., ochraceous-rusty in centre, pallid or whitish at margin, slightly silky-viscid when fresh; smell faintly radishy; on peaty soil (*N. clavuligera* (Romagn.) Kühn. & Romagn., no British record, see BSMF, **58** (1941), 124)

21. If cystidia capitate with large head then cap cuticle cellular, spores different or cap colours darker **22**

22. Marginal cystidia relatively narrow, cylindric, sometimes flexuose or slightly swollen at base or apex, 36–70/4–6(8) μ, apex 4–8 μ (Fig. 445); spores rather broadly limoniform (10)11–14/6½–8 μ; cap cuticle consisting of a layer of filamentous hyphae 3–8 μ diam. over pyriform or subglobose cells 8–30 μ diam.; basidia 2-spored; cap 11–42 mm., when moist deep date- or reddish brown, sometimes with silky sheen; stem 34–72/1½–5 mm., white then discolouring dirty brownish from base up or when handled, entirely white-silky fibrillose at first then in patches only; under willows or under alders *bohemica*

22. Marginal cystidia broader, cylindric slightly swollen below, utriform or clavate, apex often much broader (6–22 μ, as in Figs. 448, 449); spores generally more narrowly limoniform; cap cuticle cellular **23**

23. Basidia 4-spored **24**

23. Basidia 2-spored **25**

24. Spores 8½–11/4½–6 μ, ± limoniform, distinctly punctate; no taste or smell; cap 8–25 mm., tawny-brown or brown, ± scurfy sometimes cracked-scaly when dry; stem 15–25/1–2 mm., concolorous or paler at apex, slightly fibrillose-silky with pruinose apex; marginal cystidia ± clavate or subcapitate, up to 15 μ at apex (*N. submelinoides* (Kühn.) Kühn. & Romagn. s. Kühner non R. Maire; BSMF, **47** (1930), 242)

24. Spores (12)13½–15(16)/6½–8½ μ, limoniform, rough; no taste or smell; cap 8–18 mm., reddish or tawny brown, sometimes vandyke at centre, striate when moist, matt when dry; stem 15–40/0·7–1·5 mm., whitish then discolouring sepia from base, with 'fibrilles aérifères pâles très nettes', apex pruinose and sometimes with drops of liquid when wet: marginal cystidia clavate-capitate with rather long stalk, *ca.* 40–65/3–5 μ, apex 7–12 μ; on mud under *Carex* or willows (*N. langei* Kühn., *Bull. Soc. Nat. Oyonnax*, **10–11** (1957), suppl., 9 and L 125 D; no British record)

25. Cap relatively dark when moist, bay, umber or deep chocolate, often blackish bay when young, sometimes slightly rugulose in centre, 8–55 mm.; under

willows; spores limoniform, rough, (12)13–20(22)/(5½)6–8½(9) μ (Fig. 328); marginal cystidia clavate, sometimes also swollen below, often with long stalks, 38–70(100)/3–6 μ, apex 6–22 μ (Fig. 448); cap cuticle appearing cellular from above but with some erect fusiform or lageniform cells which are sometimes rather pointed at apex, 28–44/6–18 μ, apex (2)3–7 μ, together with spheropedunculate cells, 8–38 μ diam. (Fig. 446); taste none or with slightly bitterish after-taste *salicis*

25. Cap relatively pale when moist, ochraceous-buff, dull honey, pinkish buff or pinkish date-brown; under alders; spores mostly < 18 μ long (12–16(20)/6–8 μ, as in Fig. 331); marginal cystidia usually narrower at apex (7–11 μ, as in Fig. 449); cap cuticle cellular of spheropedunculate or pyriform to elongate-clavate cells 12–62 μ diam. without pointed cells (Fig. 450); taste none or mealy **26**

26. Spores elongate limoniform, on the whole narrower, 12–17(18)/(6)6½–7¼(8) μ (Fig. 331); smell none or faint or of cheap soap (especially after enclosure in tin); taste none; cap 7–27 mm., ochraceous-buff, dull honey, pallid reddish or pinkish date-brown (with or without pinkish or reddish tints); stem 18–45/1½–3 mm., pale dirty cream soon discolouring date-brown or sepia from base, finally entirely sepia-date-brown, interrupted white silky striate then almost smooth *celluloderma*

26. Spores limoniform, on the whole broader (sec Kühn. & Romagn.), 13–16(20)/(6)7–8 μ*; smell and taste distinctly mealy sec Kühner & Romagnesi; cap 7–20 mm., pinkish-buff or pallid reddish tan; stem 20–60/1–3 mm., pinkish buff or reddish brown often darker at base, silky striate (British records need confirmation) *alnetorum*

* Originally described as 6–7 μ broad by Maire.

Naucoria celluloderma sp.nov. (Figs. 218–220, 331, 449, 450)

Pileus 7–27 mm., e convexo expansus interdum umbilicatus, senectute leviter depressus margine erecto, pallide sordide rufulus vel sordide ochraceus vulgo leviter rufulo-tinctus, ad marginem primo vulgo pallidiore coloratus vel albidus, senectute ad discum fere umbrinus, siccitate sordide cremeus vel pallide sordide ochraceus interdum ad discum obscuriore coloratus, jove pluvio striatus, jove sicco opacus vel atomatus, interdum sub lente obscuriore minute maculatus. Lamellae adnatae vulgo emarginatae ventricosaeque, pallide sordide ochraceae vel argillaceo-ochraceae dein colore pilei tinctae, postremo sordide mellinae, rufulo-argillaceo-ochraceae vel dilute coffeatae rufulotinctae, subconfertae, L 16–28 l 1–3(7), ad aciem primo albo- dein albido-flocculoso denticulatae. Stipes 18–56/1–3 mm., aequalis vel ad basim leviter incrassatus vel bulbosus, pallide sordide cremeus mox sursum umbrinotinctus postremo interdum fere totus fusco-umbrinus, siccitate pallescens, minute interrupte albo-sericeo striatus (facile tritus), ad apicem primo albo-pruinosus, sine velo, cavus leviter cartilagineus. Caro concolor, siccitate intus albida. Odor nullus. Sapor nullus vel leviter raphanoideus. Sporae elongato-limoniformes, punctatae, 12–17(18)/(6)6½–7¼(8) μ (Fig. 331). Basidia 2-sporigera, 34–40/9–10 μ. Cystidia aciei lamellarum aut cylindrica vel leviter clavata interdum infra incrassata aut utriformia 34–64/7–12 μ ad apicem 7–12 μ lata (Fig. 449). Cuticula pilei cellularis, cellulis spheropedunculatis, elongato-clavatis vel clavato-fusiformibus vulgo peduncula longa, 32–96/12–62 μ (Fig. 450).

In alnetis, Downwood, Shobdon, Herefordshire, 31 Oct. 1959 (typus in Herb. Kew.). Cuticula cellulare, absentia veli, coloribus pilei et lamellarum vulgo rufulo-tinctis et stipitis obscuris insignis. N. submelinoides a basidiis 4-sporigeris, sporis minoribus, cystidiis aciei lamellarum distincte clavatis differt. N. alnetorum odore et sapore farinaceis et sporis probabiliter latioribus distinguitur.

Cap 7–27 mm., convex then expanded ± plane or sometimes umbilicate, slightly depressed with upturned margin when old, *pale pallid-reddish or ochraceous-buff usually with reddish flush*, deeper coloured when old and almost date-brown at centre, margin often paler or whitish at first, drying dirty cream or pale pallid-ochraceous or with dirty reddish tinge, sometimes slightly deeper at centre, *striate* when moist (conspicuously so when old), drying matt or atomate and sometimes minutely darker spotted or cracked-scurfy when old, often fragile. *Gills* adnate, often emarginate and ventricose to subdecurrent, pale dirty whitish-buff or pale clay-buff *then flushed colour of cap*, finally honey-buff, dull honey, reddish clay-buff or milky coffee colour with reddish flush, subcrowded, L 16–28 l 1–3(7), edge white then whitish flocculose-denticulate. *Stem* 18–56/1–3 mm., equal or slightly thickened or bulbous at base, *whitish- or pale dirty cream soon tinged date-brown or sepia from base*, finally sometimes almost entirely date-brown-sepia or vandyke, paler when dry, minutely interrupted white silky-striate, *silkiness easily rubbed off*, apex white pruinose at first, veil none, hollow, cortex rather firm and slightly cartilaginous. *Flesh* concolorous, drying whitish in centre of cap. *Smell* none. *Taste* none or fungussy to slightly radishy. *Spores elongate-limoniform*, punctate-rough, 12–17(18)/(6)6½–7¼(8) μ (Fig. 331). *Basidia* 2-spored, 34–40/9–10 μ. *Marginal cystidia cylindric slightly clavate, sometimes flexuose or slightly swollen below to utriform*, 34–64/7–12 μ, apex 7–12 μ diam. (Fig. 449). Cap cuticle *strictly cellular*, cells spheropedunculate to elongate-clavate or clavate-fusiform often with rather long stalk, 32–96/12–62 μ (Fig. 450).

Under alders: Parish Marsh, Surlingham, Norfolk, 1 Oct. 1958; Kingthorpe, Yorks, 14 Sept. 1959; Freshfield, Lancs, 16 Sept. 1959; Downwood, Shobdon, 31 Oct. 1959 (type in Herb. Kew). Probably strictly alnicole.

Recognized by the cellular cuticle, no veil, cap and gills usually rather pale and with reddish flush and dark stem. Differs from *N. submelinoides* (s. Kühner non R. Maire) in 2-spored basidia, larger spores and less distinctly clavate marginal cystidia. I thought at first this might be a 2-spored form of *N. submelinoides* but in view of these differences prefer to describe it as a separate species. The colour of the cap is almost that of L 125 B, *N. macrospora* J. Lange, which, however, has larger spores and is said by J. Lange to be associated with *Salix cinerea* and not alders and may perhaps be *N. salicis* despite paler cap colour. *N. alnetorum* differs from *N. celluloderma* in smell and taste of meal and spores on the whole slightly broader (sec Kühn. & Romagn.), but it remains to be seen if these are specific differences. I suspect that careful field work and examination of fresh material will show that the species are distinct.

Naucoria cephalescens T. J. Wallace *in litt.* sp.nov. (Figs. 221–224, 326, 452, 453)

Pileus 5–15(22) mm., e conico-convexo vel convexo expansus vel circa discum depressus, ± umbonatus interdum fere acute umbonatus, fulvo-umbrinus ad marginem clariore luteolotinctus vel totus fulvo-mellinus (juventute interdum ferrugineo-umbrinus), siccitate pallide ochraceus vel ochraceo-luteolus (ad discum saepe jove pluvio obscuriore jove sicco pallidiore coloratus), jove pluvio ad marginem striatus, ad marginem primo fibrillis albidis sericiis veli obtectus dein glabrescens. Lamellae adnatae interdum dente decurrentes, ± ventricosae, e pallide luteolo vel luteolo-ochraceo ochraceo-mellinae, subdistantes, L 12–20 l 1–3, ad aciem sub lente interdum conspicue flocculosae. Stipes 7–32/0·5–2 mm., aequalis vel ad basim leviter incrassatus, saepe flexuosus, primo albidus vel pallide sordide luteolus dein sursum mellino vel colore pilei tinctus, postremo fere totus fulvo-mellinus, ad apicem albido-pruinosus, ad mediam partem fibrillis albis annuloso-zonatis evanescentibus veli obtectus dein glabrescens, farctus vel anguste cavus, ad basim primo albido-tomentosus dein interdum glabrescens. Caro concolorata, siccitate intus pallide sordide ochracea. Odor nullus. Sapor farinaceus. Sporae ellipsoideo-amygdaliformes, laeves sub immers., (9)10–12(13)/5–6 μ (Fig. 326), aliquantum crassotunicatae sed in cumulo luteolo-brunneae vel sordide ferrugineae. Basidia 4-sporigera, 30–40/7–9 μ. Cystidia aciei lamellarum diversiformia, 22–60/4–8 μ, aut lageniformia ad apicem angusta interdum acuta 1–5 μ lata, aut subcapitata vel irregulariter capitata, interdum capitulo magno ± globoso haud raro aliquantum crassotunicato 4–22(28) μ diam. (Fig. 453). Cystidia faciei lamellarum nulla. Cellulae cuticulae pilei (1) cylindricae, angustae, fibulatae, raro ramosae, hyalinae vel incrustato-pigmentatae, 3–10 μ latae; (2) ellipsoideae, curvatae, clavatae vel leviter strangulatae, latiores, raro ramosae, 10–20(24) μ latae (Fig. 452).

Ad terram palustrem inter Scirpos vel in lacuna exsiccata prope Salices, Dawlish Warren, Devon, 29 Oct. 1955 (typus in Herb. Kew.); ad terram lacunarum exsiccatarum et inter Sphagnos, Downwood, Shobdon, Herefordshire, 24 Oct. 1959. Coloribus pilei claris, cystidiis diversiformibus interdum magnicapitatis, sporis laevibus insignis. N. permixta proxime accedit, quae a coloribus pilei obscurioribus, cystidiis numquam magnicapitatis differt. N. clavuligera a sporis majoribus asperis, pileo jove pluvio viscidulo, coloribus pallidioribus et cystidiis ad apicem minoribus distinguitur.

Cap 5–15(22) mm., conico-convex or convex then expanded or depressed around centre, ± umbonate sometimes rather acutely so, burnt sienna or *date-brown tawny with brighter yellowish margin to entirely tawny-honey* (when young sometimes entirely rusty date), drying pale ochraceous or ochraceous-buff from centre (when moist centre often darker than rest, when dry often paler), striate at margin when moist, at first with whitish silky fibrils from veil at margin but these soon disappear. *Gills* adnate sometimes with tooth, ± ventricose, *pale yellowish buff or ochraceous-buff then ochraceous-honey or ochre-buff*, subdistant, L 12–20 l 1–3, edge flocculose-denticulate sometimes conspicuously so under lens. *Stem* 7–32/½–2 mm., equal or slightly thickened at base, often flexuose, *at first whitish or pale dirty yellowish, then tinged honey or colour of cap from base*, finally almost entirely tawny-honey, apex whitish pruinose, at first with *fugacious white fibrils from veil as ring-zone or patches* on middle part, then smooth, stuffed or narrowly hollow, base whitish tomentose at first sometimes becoming smooth. *Flesh* concolorous, drying pale dirty ochraceous in cap centre. *Smell* none. *Taste mealy*. *Spores* ellipsoid-amygdaliform, *smooth* sub immers., *(9)10–12(13)/5–6* μ (Fig. 326), fairly thick-walled but buff or pale snuff to dull rusty in mass. *Basidia* 4-spored, 30–40/7–9 μ. *Marginal cystidia* variously shaped, 22–60/4–8 μ, some lageniform with narrow rather acute apex 1–5 μ diam., others subcapitate or irregularly capitate, some with ± *globose sometimes rather thick-walled head 4–22(28)* μ diam. (Fig. 453). Cap cuticle heterocellular of (1) narrow filamentous, clamped, occasionally branched hyphae, cells ± cylindric sometimes encrusted-pigmented 3–10 μ diam., and (2) broader hyphae of hyaline ellipsoid, sausage-shaped, clavate or slightly constricted, occasionally branched cells 10–20(24) μ diam. (Fig. 452).

On marshy ground in *Scirpus* or in dried-up pool near willows. Dawlish Warren, 29 Oct. 1955 (type in Herb. Kew); at edge of dried-up pools and in *Sphagnum*, Downwood, Shobdon, 24 Oct. 1959.

Despite bright cap colours and smooth spores this is best placed in *Naucoria* on account of the dull-coloured spore print and heterocellular cap cuticle, as in some other members of *Naucoria* sect. Alnicola. Distinguished by bright cap colours, variability of cystidia, some of which have large heads, and smooth spores. *N. permixta* is very close but has duller darker colours and marginal cystidia with less conspicuous heads. *N. clavuligera* differs in larger rough spores, slightly viscid moist cap, duller and paler colours and cystidia with rather smaller heads.

Naucoria permixta sp.nov. (Figs. 225–228, 327, 451)

Pileus 4–15 mm., e convexo expansus interdum leviter depressus, haud raro obtuse vel leviter acute umbonatus, fulvo-mellinus vel umbrinus ad marginem interdum pallidiore magis luteolus vel fulvotinctus, ad discum vulgo obscuriore coloratus (fusco-brunneus), siccitate ochraceus vel sordide ochraceus ad discum haud raro fulvotinctus, jove pluvio striatus interdum leviter viscidulus, jove sicco opacus vel praecipue ad discum cuticula minute areolata, ad marginem primo residuis veli albi obtectus dein glabrescens. Lamellae adnatae vel dente parvo decurrentes, ± ventricosae, e pallide-mellino vel -ochraceo inde ochraceo-mellinae interdum juxta carnem pilei leviter fulvotinctae, subdistantes, L 14–20 l 1–3, ad aciem albido-flocculosae. Stipes 12–25/½–1½(2) mm., aequalis vel ad basim leviter incrassatus, pallide sordide ochraceus vel mellinus haud raro leviter luteolotinctus, vulgo sursum obscurascens, ad aciem primo luteolo-pruinosus, e velo albo vel albido vulgo evanescente annuloso-zonatus et infra maculatus, farctus vel anguste cavus. Caro concoloratus, siccitate intus pallidiore coloratus. Odor nullus vel debilis, farinaceus. Sapor farinaceus. Sporae ellipsoideo-amygdaliformes, laeves sub immers., (9)10–12/5–6 μ (Fig. 327) in cumulo luteolo-brunneae. Basidia 4-sporigera, 24–30/7–8 μ. Cystidia aciei lamellarum cylindrico-flexuosa vulgo ad apicem clavato-capitata vel infra incrassata, 22–56/4–6 μ ad apicem 3–8(11) μ lata (Fig. 451). Cellulae cuticulae pilei (1) angustae subcylindricae interdum incrustato-pigmentatae, vulgo fibulatae, 3–6 μ latae: (2) latiores, ellipsoideae, clavatae vel late cylindricae, raro ramosae, vulgo fibulatae, interdum incrustato-pigmentatae, 20–60/8–20 μ: (3) paucae latissimae vesiculosae 30–40 μ latae.

In salicetis vel ad foliis Salicis, Elstead, Surrey, 13 Oct. 1955 (typus in Herb. Kew.). A Galerinis colore sordido sporarum in cumulo differt. N. cephalescens item sporis laevibus, a coloribus clarioribus, cystidiis interdum magnicapitatis differt. Sporis laevibus Naucoriis sectionis Alnicolae plurimis distinguitur.

Cap 4–15 mm., convex then expanded and sometimes slightly depressed, sometimes obtusely or slightly acutely umbonate, *tawny-honey to date-brown or sepia*, *margin sometimes paler and more yellow* or tinged tawny and centre darker sepia or vandyke, drying ochraceous or ochraceous-pallid from centre out, centre often retaining tawny tinge, striate when moist and *sometimes slightly viscid*, matt or with cuticle cracking into minute patches especially round centre when dry, margin sometimes with traces of white veil at first. *Gills* adnate or with slight tooth, ± ventricose, *pale yellowish-honey or pallid-ochraceous then ochraceous-honey*, sometimes with slight tawny tinge towards flesh of cap, subdistant, L 14–20 l 1–3, edge paler or whitish flocculose. *Stem* 12–25/½–1½(2) mm., equal or slightly swollen at base, *pale pallid-ochraceous or pale honey*, *often with slight yellowish tinge*, to pale date-brown, *often becoming darker sepia from base*, *white or whitish veil* forming ring-zone and scattered patches below, which are often fugacious, apex yellowish pruinose at first, stuffed or narrowly hollow. *Flesh* concolorous, drying paler in cap centre. *Smell* none or faint mealy. *Taste mealy*. *Spores* ellipsoid-amygdaliform, *smooth* sub immers., *(9)10–12/5–6* μ (Fig. 327), yellowish snuff to 'Cinnamon Brown' (Ridgeway) in mass. *Basidia* 4-spored, 24–30/7–8 μ. *Marginal cystidia cylindric flexuose often with clavate-capitate apex* *and slightly swollen below*, 22–56/4–6 μ, apex 3–8(11) μ (Fig. 451). Cap cuticle heterocellular of (1) narrow subcylindrical often clamped hyphae 3–6 μ diam., similar to those of veil on stem, cells sometimes encrusted-pigmented; (2) broader hyphae of ellipsoid, clavate or broadly cylindric cells 20–60/8–20 μ, occasionally branched, often clamped, sometimes encrusted-pigmented; (3) a few broader vesiculose cells, 30–40 μ diam.

Under *Salix* spp. on soil or on *Salix* leaves (probably salicicole). Elstead, 13 Oct. 1955 (type in Herb. Kew); Studland, Dorset, 27 Oct. 1955. Might be mistaken for a Galerina but spore-print colour and heterocellular cuticle permit recognition as a Naucoria. Differs from most other *Naucoria* spp. in sect. Alnicola in the smooth spores. *N. sphagneti* with smooth but smaller spores has a scurfy-scaly cap and acutely pointed cystidia. *N. cephalescens* is rather similar but differs in brighter colours and in some of the marginal cystidia having large heads.

Naucoria salicis sp.nov. (Figs. 229–232, 328, 446–448)

Pileus 8–55 mm., e conico-convexo vel convexo conico-expansus vel expansus late leviter conico-umbonatus interdum senectute planus vel leviter depressus, juventute obscure badius, umbrinus vel nigro-umbrinus dein rufo-cacainus ad marginem clariore rufulo-luteolo-brunneus vel ochraceo-rufulus, senectute sordide cacainus, jove sicco sordide rufulus vel incarnato-luteolo-brunneus, vulgo ad discum persistentiore obscurus, jove pluvio ad marginem striatus et juventute minute albo-pruinosus, jove sicco opacus et vulgo circa discum rugulosus, interdum senectute ad marginem furfuraceo-diffractus, ad marginem primo e velo fibrillis longis albidis mox fugacibus sparse ornatus. Lamellae adnatae saepe ventricosae, ex albido mox pallide argillaceae dein pallide argillaceo-fuscae postremo argillaceo-cinnamomeae, subconfertae, L 16–30 l 3–7, interdum venosae, ad aciem viriditate conspicue albido-denticulatae. Stipes 25–70/1½–6 mm., aequalis vel deorsum incrassatus vel ad basim leviter incrassatus, interdum flexuosus, primo totus albo-sericeus dein mox pallide fuscus vel sordide brunneolus, vulgo senectute infra obscure fuscus, sericeo-striatus, ad apicem albofloccoso-pruinosus, e velo albo vel albido supra fugace floccoso-maculatus, cavus, ad basim albo-tomentosus. Caro pilei concolorata siccitate albida, in corticem stipitis colore cornus tincta vel pallide fusca saepe infra obscuriore fusca. Odor nullus. Sapor nullus dein interdum tarde (10–30 sec.) levissime acris vel raphanoideus. Sporae limoniformes, punctato-asperae, (12)13–20(22)/(5½)6–8½(9) μ (Fig. 328). Basidia 2-sporigera, 32–42/8–10 μ. Cystidia aciei lamellarum ± clavata vel supra irregulariter incrassata, interdum infra flexuosa et longe pedunculata, fasciculata, 38–70(100)/3–6 μ ad apicem 6–22 μ lata (Fig. 448). Cystidia faciei lamellarum nulla. Cuticula pilei supra visa cellularis sed cellulae aut subglobosae vel ellipsoideae 8–38 μ latae aut erectae clavatae, fusiformes vel lageniformes interdum ad apicem fere acutae, 28–44/6–18 μ ad apicem (2)3–7 μ latae (Figs. 446, 447). Hyphae veli filamentosae 3–7 μ latae, hyalinae. Cellulae fibulatae non visi.

In salicetis inter folias humidas putrescentibus, Thack Marsh, Surlingham, Norfolk, 5 Sept. 1959 (typus in Herb. Kew.). A coloribus obscuris, stipite sericeo-striato, sporis magnis et characteribus cellularum cuticulae pilei facile distinguitur. N. alnetorum et N. celluloderma a coloribus pallidioribus, habitatione in alnetis (N. alnetorum odore farinaceo) differunt. N. macrospora J. Lange fortasse idem est, sed coloribus pallidioribus iconis auctoris differt.

Cap 8–55 mm., conico-convex or convex then expanded-conical or expanded, broadly shallowly conico-umbonate, sometimes plane or slightly depressed when old, *deep bay, umber or blackish date when young then paler reddish chocolate with rather brighter reddish buff or ochraceous reddish margin fading to dull chocolate when old*, drying pallid-reddish or pinkish buff, often with persistently darker central spot, striate at margin when moist and with *minute whitish bloom* when fresh, drying matt and *often rugulose or radially wrinkled round centre*, sometimes cracked-scurfy near margin when old and dry, margin at first with soon fugacious scattered rather long whitish fibrils from veil. *Gills* adnate, sometimes with slight tooth, usually ventricose, *whitish soon pale clay* then pale to rather deep clay-sepia or snuff-brown, subcrowded, L 16–30 l 3–7, sometimes veined on sides or inter-veined, edge conspicuously whitish denticulate when fresh. *Stem* 25–70/1½–6 mm., equal or slightly thickened downwards or slightly attenuated at base, sometimes flexuose, *entirely white silky at first*, soon discolouring pale sepia or dirty brownish when handled or with age, often dark sepia or vandyke at base when quite old, apex white floccose-pruinose, remainder silky striate, white or whitish veil leaving soon fugacious floccose patches below apex, hollow, base white tomentose. *Flesh* of cap concolorous drying whitish, of stem cortex pale sepia or pale horny often darker sepia in lower part. *Smell* none. *Taste* none, sometimes with very slight bitterish or radishy after-taste (10–30 sec.). *Spores limoniform*, punctate-rough, *(12)13–20(22)/(5½)6–8½(9)* μ (Fig. 328). *Basidia 2-spored*, 32–42/8–10 μ. *Marginal cystidia ± clavate* or irregularly swollen above or flexuose below, *often with long stalks and in tufts* (most noticeable when young and fresh), 38–70(100)/3–6 μ, apex 6–22 μ (Fig. 448). *Facial cystidia* absent. Cap cuticle appearing cellular from above but cells *either* subglobose or ellipsoid, 8–38 μ diam., *or* erect, clavate, *fusiform or lageniform* sometimes with rather pointed apex, 28–44/6–18 μ, apex (2)3–7 μ (Figs. 446, 447). Hyphae of veil filamentous 3–7 μ diam., hyaline. No clamps seen.

Under *Salix* spp. in decaying leaves and humus in wet places. Epsom Common, Surrey, 28 Sept. 1953, 19 Oct. 1955; Thack Marsh, Surlingham (under sallow), 17 July 1956, 5 Sept. 1959 (type in Herb. Kew); Freshfield, Lancs, 16 Sept. 1959.

Readily recognized by dark colours, silky striate stem, habitat, large spores and cap cuticle characters. *N. alnetorum* is paler, has a mealy smell and occurs under alders, *N. celluloderma* also occurs under alders and is paler and has spores mostly 17 μ or less in length. At first I named this fungus *N. bohemica* on account of the white silky stem, but this was an error because my fungus has larger broader cystidia, larger spores and a different cap cuticle. The second description of *bohemica* 'f. bisporique' of Kühner (*BSMF*, **51** (1935), 201) is probably referable to *N. salicis*. Judging by macroscopic characters, *Galerula mirabilis* Atkinson seems likely to be the same. Singer has examined type material and maintains that *G. mirabilis* is the same as *N. alnetorum*; I think this unlikely, however, on account of (1) darker colours ascribed to *G. mirabilis* by Atkinson than those given for *N. alnetorum* by R. Maire, (2) no mention of mealy smell for *G. mirabilis*, (3) habitat not specifically given as under alders ('in mixed wood in a swamp'). The microscopic characters given by Singer for type material of *G. mirabilis* agree closely with those for *N. salicis*, but there is no mention of pointed erect cells in the cap cuticle; these, however, may well be difficult to see in dried material. *N. macrospora* J. Lange may also be *N. salicis*, but J. Lange's plate is of a paler agaric than the latter, though this might be accounted for if the paintings were made from specimens which were drying. *N. macrospora* has been given as a synonym of *N. alnetorum*, which, however, I think unlikely in view of the habitat 'associated with *Salix cinerea* and not alder' given by J. Lange and also the pale colour of J. Lange's specimens. The problem of *G. mirabilis* and the later *N. macrospora* remains to be solved, preferably in the field at the type localities if possible. *N. salicis* is one of several apparently salicicole fungi, viz. *N. permixta*, *Galerina salicicola*, and *Hebeloma leucosarx* which seem to have escaped the attention of modern mycologists.

Naucoria sphagneti sp.nov. (Figs. 329*a*, 456, 457)

Pileus 8–27 mm., e convexo expanso-convexus, vulgo umbone parvo obtuso, raro senectute leviter depressus, umbrinus vel badius dein praecipue ad marginem pallescens (luteolotinctus vel cinnamomeus), siccitate pallide luteolobrunneus ad discum umbrino- vel fulvo-tinctus, jove pluvio interdum ad marginem striatus, totus squamulis pallide-ochraceis vel luteolis minutis adpressis obtectus vel furfuraceo-tomentosus. Lamellae adnatae interdum ventricosae vel leviter emarginatae, pallide sordide luteolae vel leviter umbrinotinctae dein aquose luteolobrunneae vel sordide umbrinae, subconfertae, L 20–24 l 3–7, ad aciem integrae vel sub lente minute denticulatae. Stipes 32–65/1½–2½ mm., aequalis vel ad basim leviter incrassatus, pallide umbrinus dein obscuriore umbrinus, ad apicem pallide ochraceo-pruinosus, primo e velo squamulis pallide-ochraceis vel luteolis praecipue supra obtectus dein vulgo albido-striatus, cavus, ad basim albido-tomentosus. Caro concolorata, vulgo intra pileo jove pluvio obscuriore colorata. Odor nullus vel debilis. Sapor nullus vel leviter rancido-oleaceus. Sporae ellipsoideo-amygdaliformes, laeves vel haud punctatae sub immers., (7½)8–10/5–6 μ (Fig. 329*a*), in cumulo pallide sordide luteolobrunneae. Basidia 4-sporigera, ca. 24/7–8 μ. Cystidia aciei lamellarum lageniformia ad apicem acuta, rariore subcylindrica, 30–56/6–14 μ ad apicem 1–2 μ lata (Fig. 457). Cellulae ad apicem stipitis catenulatae nunc similes nunc ellipsoideae vel clavatae 20–40/10–15 μ. Cellulae cuticulae pilei (1) subcylindricae 6–12(20) μ latae vulgo incrustato-pigmentatae; (2) catenulatae, ellipsoideae, ovoideae, subcylindricae vel vesiculosae ad apicem angustiores (cellulae ultimae), 20–40/14–24 μ (Fig. 456).

Inter Sphagnos, Loch-an-Eilean, Rothiemurchus, Inverness-shire, 27 Sept. 1955 (typus in Herb. Kew.). A N. subconspersa et N. luteofibrillosa sporis minoribus fere laevibus, habitatione, a N. subconspersa coloribus minus rufobrunneo tinctis pileo luteolo-squamuloso, a N. luteolofibrillosa coloribus obscurioribus differt. Agaricus (Naucoria) conspersus b. uliginosus Fries, *Syst. Mycol.* 1 (1821), 261 idem censeo, sed non N. uliginosa Peck, 1901.

Cap 8–27 mm., convex then expanded-convex often with small obtuse umbo, rarely slightly depressed when old, *deep date-brown or bay*, *becoming paler round margin as cap expands* (buff or yellowish date-brown), drying pale buff with date-brown or slight tawny tinge at centre, sometimes striate at margin when moist, *entirely pale ochraceous or yellowish minutely adpressed-scaly or scurfy-tomentose*. *Gills* adnate, sometimes ventricose or slightly emarginate, *pale buff* or tinged umber, *then watery buff or pallid umber*, subcrowded, L 20–24 l 3–7, edge even or minutely denticulate under lens. *Stem* 32–65/1½–2½ mm., equal or slightly swollen at base, pale date-brown then darker, sometimes becoming deep date-brown or sepia, *at first with scattered pale ochraceous or yellowish scales from veil*, which are most abundant near apex, *then whitish silky-striate*, hollow, base whitish tomentose. *Flesh* concolorous, often dark in cap when moist. *Smell* none or faint pleasant. *Taste* none or slightly oily-rancid. *Spores* ellipsoid-amygdaliform, smooth or faintly punctate sub immers. (7½)*8–10/5–6* μ (Fig. 329*a*), pale snuff-brown in mass. *Basidia* 4-spored, *ca.* 24/7–8 μ. *Marginal cystidia lageniform with acute apex*, more rarely subcylindrical tapering to a point, 30–56/6–14 μ apex 1–2 μ (Fig. 457). Similar cells at stem apex together with chains of ellipsoid cells with end cell ± clavate, 20–40/10–15 μ. Cap cuticle heterocellular: (1) subcylindric often encrusted-pigmented cells 6–12(20) μ diam.; (2) *chains of ellipsoid, ovoid or subcylindric cells*, end cell sometimes vesiculose with narrow apex, 20–40/14–24 μ (Fig. 456).

In *Sphagnum*, Loch-an-Eilean, Rothiemurchus, 26 Aug. 1955 and 27 Sept. 1955 (type in Herb. Kew). Differs from *N. subconspersa* and *N. luteolofibrillosa* in the smaller smoother spores and habitat, and from *N. subconspersa* in being less red-brown and with cap yellowish scaly and from *N. luteolofibrillosa* in the darker colours. I think this is *Agaricus* (Naucoria) *conspersus* b. *uliginosus* Fries, *Syst. Mycol.* 1 (1821), 261, but not *N. uliginosa* Peck, 1901.

Naucoria stagninoides sp.nov. (Figs. 213–215, 334, 459–461)

Pileus 7–22 mm., e convexo expansus vel leviter depressus, sine umbone vel leviter obtuse umbonatus, obscure cacainus vel fusco-umbrinus, siccitate ochraceus fulvotinctus dein pallide ochraceo-luteolus, jove pluvio exstriatus, jove sicco opacus, ad marginem primo residuis veli sericei albidi obtectus dein glabrescens. Lamellae adnatae, interdum pileo expanso subdecurrentes, ± ventricosae, pallide sordide luteolobrunneae interdum juxta carnem pilei colore pilei tinctae dein pallide sordide ochraceo brunneae, subdistantes, L 12–14 l (1)3, ad aciem sub lente leviter flocculosae. Stipes 20–30/1½–3 mm., aequalis vel ad basim vel ad apicem leviter incrassatus, concoloratus sed supra pallidiore coloratus, ad apicem albosericeo pruinosus, juventute residuis veli albi vel albidi obtectus dein glabrescens sed opacus, anguste cavus, ad basim leviter albido-tomentosus. Caro concolorata, siccitate intus pallide sordide ochraceo. Odor et sapor nulli vel debiles. Sporae ellipsoideae laeves poro germinativo 12–15/8–9 μ (Fig. 334), in cumulo fusco-cinnamomeae. Basidia 4-sporigera 46–52/12–14 μ (Fig. 461). Cystidia aciei lamellarum vulgo anguste lageniformia cervice longa flexuosa, rariore cylindrico-flexuosa hac atque illac strangulata vel incrassata, 40–66/5–10 μ ad apicem 4–7 μ lata (Fig. 459). Cystidia faciei lamellarum nulla. Cellulae ad apicem stipitis similes sed aliquantum breviores vel angustiores, ca. 30–60/4–6 μ. Cellulae cuticulae pilei (1) subcylindricae vulgo incrustato-pigmentatae, 4–8 μ latae; (2) breviores latiores, ellipsoideae, curvatae vel leviter clavatae, vulgo hyalinae, interdum ramosae, ca. 40–80/6–20(24) μ (Fig. 460). Hyphae fibulatae non visi.

Ad terram turfosam muscosam, Mid-Yell, Shetlands, 23 July 1958 (typus in Herb. Kew.). Species distinctissima, a Naucoriis plurimis sporis poro germinativo differt. Coloribus jove pluvio obscuris exceptione lamellarum, pileo exstriatus et sporis maxime insignis. N. stagnina a velo albo magis copioso ad marginem pilei et ad apicem stipitis squamulas albes formante, pileo jove pluvio striato leviter viscidulo et fulvotincto, cuticula pilei filamentosa facile distinguitur.

Cap 7–22 mm., convex then expanded slightly depressed, not or slightly umbonate, *deep chocolate or dark vandyke*, *drying from centre ochraceous with slight tawny tinge then paler ochraceous-yellowish*, *not striate* when moist, matt when dry, margin at first with traces of whitish silky veil. *Gills* adnate with tooth, sometimes becoming subdecurrent when cap is expanded, ± ventricose, *pale dirty buff then sometimes tinged colour of cap* especially at base, *or pallid-buff*, subdistant, L 12–14 l (1)3, edge slightly flocculose or eroded under lens. *Stem* 20–30/1½–3 mm., equal or slightly thickened at apex or base, *concolorous but paler above*, apex white silky-pruinose, when young with *white or whitish veil traces at apex* then matt, narrowly hollow, base slightly whitish tomentose. *Flesh* concolorous, drying pale dirty ochraceous in centre of cap and stem. *Smell* and *taste* none or faint, fungussy. *Spores* ellispoid, *smooth with germ pore, 12–15/8–9 μ* (Fig. 334), *snuff-*

or cigar-brown in mass. *Basidia* 4-spored, *rather large* 46–52/12–14 μ with stout sterigmata 5–8 μ long by 2½–3 μ broad at base (Fig. 461). *Marginal cystidia* mostly narrowly lageniform often with long flexuose neck, with a few cylindric-flexuose constricted or thickened here and there, 40–66/5–10 μ, apex 4–7 μ diam. (Fig. 459); similar but rather shorter or narrower cells at stem apex, *ca.* 30–60/4–6 μ. *Facial cystidia* absent. Cap cuticle heterocellular of (1) cylindric often encrusted-pigmented hyphae 4–8 μ diam., and (2) hyphae with shorter broader slightly clavate, ellipsoid or sausage-shaped usually hyaline sometimes branched cells, *ca.* 40–80/6–20(24) μ (Fig. 460). (In vertical section a few of the clavate cells can be seen to project slightly above the surface of the cuticle.) No clamps seen.

On mossy peaty soil, Mid-Yell, Shetlands, 23 July 1958 (type in Herb. Kew). I have placed this in *Naucoria* by reason of the colour of the spore-print and hygrophanous cap with heterocellular cuticle, despite spores with germ pore, having emended *Naucoria* accordingly (see p. 308). It is readily distinguished not only by the large spores with germ pore but also by the dark stem and non-striate cap, relatively paler gills and large basidia. I think it is different from *N. stagnina* (= *Galerina stagnina* (Fr.) Kühn.) and *N. zetlandica* because it has a much less conspicuous veil, non-striate darker cap, larger basidia and narrower marginal cystidia, as well as not being strictly sphagnicolous like *N. stagnina* (quite common in Britain in *Sphagnum*, especially on high ground and in the west) and *N. zetlandica* (found on lower ground). The colour of the spore prints of these three species is, however, pale snuff in thin deposit and deep snuff to cigar-brown in thick, and it is for this reason that I have placed them in *Naucoria*. M. Lange (*Greenland Agaricales*, III, 65) correctly says that his *stagnina*, which I believe to be *zetlandica*, cannot be placed in *Galerina* on account of the spore print not being rusty, but he places it in *Psilocybe*, a choice with which I cannot agree, since there is no violaceous tinge whatever in the spore print.

Naucoria striatula sp.nov. (Figs. 233–235, 332)

Pileus 7–32 mm., e convexo vel conico-convexo mox expanso-convexus postremo fere planus, interdum leviter umbonatus vel ad marginem undulato-lobatus, umbrinus vel fusco-umbrinus ad marginem sordide luteolo-ochraceus, interdum senectute fere totus pallide umbrinus, siccitate pallide sordide luteolus vel ad discum ochraceo-tinctus, jove pluvio ad discum striatus, jove sicco opacus leviter atomatus vel minute sericeo-flocculosus, juventute ad marginem residuis fugacissimis veli obtectus. Lamellae adnatae interdum leviter emarginatae, ventricosae, e pallide cremeo mox pallide sordide luteolae vel sordide ochraceae dein obscuriores vel leviter olivaceo-tinctae postremo fusco-cinnamomeae, subconfertae, L 16–24 l 3–7, ad aciem fere integrae. Stipes 28–75/1–3 mm., aequalis vel sursum attenuatus, vulgo ad basim leviter bulbosus, pallide sordide luteolus mox ad basim fusco-tinctus dein totus obscure fuscus vel nigro-fuscus, primo minute interrupte albosericeo striatus, ad apicem floccis sparsis pallide luteolis obtectus dein glabrescens, anguste cavus, juventute aliquantum cartilagineus. Caro concolorata. Odor et sapor nulli. Sporae amygdaliforme-limoniformes, punctato-asperae, 8½–12/4½–5¼(5½) μ (Fig. 332). Basidia 4-sporigera, 32–38/7–9 μ. Cystidia aciei lamellarum lageniformia cervice anguste ad apicem acuta, 38–66(80)/7–14 μ, cervice 20–40(50) μ longa, ad apicem raro subcapitata 2–4 μ lata. Cellulae cuticulae pilei (1) cylindricae vel leviter fusiformes, hyalinae vel incrustato-pigmentatae 4–12 μ latae; (2) ellipsoideae, subglobosae, curvatae vel clavatae 12–38 μ latae.

In alnetis, Kingthorpe, Yorks, 14 Sept. 1959 (typus in Herb. Kew.). Siccitate N. escharoidem in mentem revocans, sed a stipite molto obscuriore brunneo sporis angustioribus, juventute a pileo ad discum obscuriore colorato, senectute jove pluvio a pileo striato differt; N. scolecina magis rufo-brunneo coloratus est et sporis majoribus habet.

Cap 7–32 mm., convex or conico-convex, soon expanded-convex finally almost plane, sometimes slightly umbonate or wavy-lobed at margin, *sepia, date-brown or vandyke in centre with paler yellowish buff margin*, sometimes almost entirely pale date-brown when old, when young with darker central spot, drying from centre pale dirty buff or with slight yellowish tint, generally darker or sometimes tinged ochraceous at centre, *striate to centre* when moist, matt and slightly atomate or minutely silky flocculose when dry, sometimes minutely cracked-scaly when old, with *very fugacious veil fragments at margin when young*. *Gills* adnate sometimes slightly emarginate, ± ventricose, at first pale cream, soon pale dirty yellowish or pale buff then deeper dirty yellowish buff or with slight olivaceous tinge, finally deep buff to snuff-brown, subcrowded, L 16–24 l 3–7, edge almost even. *Stem* 28–75/1–3 mm., equal or attenuated at apex, often slightly bulbous at base, *pale dirty buff, soon sepia or dark vandyke from base up, finally entirely dark vandyke, minutely interrupted white-silky striate* then ± matt, apex with scattered yellowish flocci at first which usually soon disappear, narrowly hollow, rather firm and cartilaginous when fresh. *Flesh* concolorous. *Smell* none. *Taste* mild. *Spores* amygdaliform-limoniform, *8½–12/4½–5¼(5½)* μ (Fig. 332), punctate-rough. *Basidia* 4-spored, 32–38/7–9 μ. *Marginal cystidia lageniform with long narrow neck* (*Urtica*-hair shaped), 38–66(80)/7–14 μ, neck 20–40(50) μ long, apex 1–2 μ, occasionally slightly capitate 2–4 μ diam. Cap cuticle heterocellular, of (1) subcylindric or slightly fusiform hyaline or encrusted-pigmented cells 4–12 μ diam., and (2) ellipsoid, subglobose, sausage-shaped or clavate cells 12–38 μ diam.

Under alders: Kingthorpe, Yorks, 14 Sept. 1959 (type in Herb. Kew); Freshfield, Lancs, 16 Sept. 1959; Downwood, Shobdon, Herefordshire, 24 Oct. 1959. When dry resembling *N. escharoides* but stem much darker, spores narrower, and cap when moist striate to centre; when young easily distinguished from *escharoides*, which is uniformly pale even when moist, by dark central spot of cap. Differs from *N. scolecina* in not having reddish brown colours and in smaller spores. I have long been puzzled by the different spore sizes given for *N. escharoides* (see Fig. 333 for spores which are (9)10–13/5–6½ μ) and suspect that *striatula* and *escharoides* as defined in the key above have been confused in the past. After making a number of collections of both I believe them to be definitely distinct and readily distinguishable in the field.

Naucoria subconspersa sp.nov. (Fig. 330)

Pileus 6–30(44) mm., e convexo expansus, acute vel obtuse umbonatus, rufo-brunneus vel rufo-umbrinus, siccitate luteolo- vel pallide sordide rufo-brunneus vel fere umbrinus, interdum ad marginem pallidiore coloratus vel ad discum fulvo-tinctus, jove pluvio exstriatus vel leviter striatus, e velo albido residuis sparsis obtectus vel furfuraceo-fibrillosus. Lamellae adnatae, vulgo ventricosae, pallide rufo-brunneae vel fere colori pilei similes, subdistantes, L 18–22 l (0)1–3, interdum aliquantum crassae, ad aciem pallidiore flocculosae. Stipes 22–80/1–3(4) mm., aequalis, vulgo ad basim leviter bulbosus, pileo concoloratus interdum ad apicem pallidiore rufo-brunneus et leviter pruinosus, e velo pallide sordide brunneo vel sordide ochraceo praecipue prope apicem zonatus vel sparse squamulosus, infra zonas veli interdum albido-sericeo striatus, cavus, ad basim albo-tomentosus. Caro colori pilei concolorata, siccitate pallidiore rufula. Odor nullus. Sapor mitis vel levissime acris. Sporae amygdaliformes vel limoniformes, asperae, (9) 10–12½/5–6 μ (Fig. 330). Basidia 4-sporigera. Cystidia aciei lamellarum anguste lageniformia ad apicem acuta, 30–60/4–7 μ ad apicem 1–2(3) μ lata rarissime subcapitata usque ad 6 μ lata. Cellulae cuticulae pilei diversiformes, ellipsoideae, curvatae vel leviter clavatae, 20–50/15–35 μ; cellulae hypharum squamularum pilei fusiformes vel cylindricae catenulatae interdum pigmentatae, 20–80/5–20 μ.

In alnetis, Badger Falls, Glen Affric, Inverness-shire, 20 Aug. 1955 (typus in Herb. Kew.). A N. scolecina velo distincto, pileo jove pluvio minus striato et furfuraceo-fibrilloso differt. N. luteolofibrillosa, quae simile velata est, a coloribus albidis vel sordide luteolis numquam rufo-brunneis facile distinguitur.

Cap 6–30(44) mm., convex then expanded, acutely or obtusely umbonate, *reddish date-brown or dull reddish brown to almost umber*, drying yellowish or reddish buff, sometimes tinged tawny at centre or paler at margin, not or rarely more than slightly striate when moist, *covered with scattered whitish remnants of veil or appearing scurfy-fibrillose. Gills* adnate, often ventricose, *pale reddish brown, or almost colour of moist cap*, subdistant, L 18–22 l (0) 1–3, sometimes rather thick, edge paler flocculose. *Stem* 22–80/1–3 mm., equal, often with slightly bulbous base, *concolorous with cap* but apex sometimes slightly paler and slightly pruinose, *veil leaving pale dirty brownish or pallid-ochraceous zones or scattered small scales* especially near apex, below these sometimes whitish silky striate, hollow, base white tomentose. *Flesh* concolorous, drying paler. *Smell* none. *Taste* mild or very slightly bitterish. *Spores* amygdaliform or limoniform, rough, (9) 10–12½/5–6 μ (Fig. 330). *Basidia* 4-spored. *Marginal cystidia lageniform with narrow neck* or *Urtica*-hair shaped, 30–60/4–7 μ, apex 1–2(3) μ diam., more rarely with swollen tips < 6 μ diam. Cells of cap cuticle variously shaped, ellipsoid, sausage-shaped, slightly clavate, 20–50/12–35 μ; cells of scales on cap fusiform or cylindric, in chains, sometimes pigmented, 20–80/5–20 μ.

Under alders: Badger Falls, Glen Affric, 20 Aug. 1955 (type in Herb. Kew); Loch-an-Eilean, Rothiemurchus, Inverness-shire, 26 Aug. 1955; Mousewood Farm Wood, Honingham, Norfolk, 20 July 1958; Freshfield, Lancs, 16 Sept. 1959; Mortimer's Cross, Herefordshire, 22 Oct. 1959. Coloured rather like *N. scolecina* but a redder brown and differs in having a veil and cap not or usually only slightly striate when moist. *N. luteolofibrillosa*, which is similarly veiled, is whitish or dirty yellowish and lacks red-brown colours. I suspect *N. subconspersa* is early-fruiting. It is *N. conspersa* (Pers. ex Fr.) Kummer s. J. Lange, but not *Agaricus* (*Naucoria*) *conspersus* Pers. ex Fr., s. Fries, Romagnesi, and was renamed *N. subconspersa* by Kühner (1953, p. 237) without Latin diagnosis.

Naucoria sumptuosa sp.nov. (Figs. 211–212, 397)

Pileus 10–40 mm., e convexo expansus vel expanso-convexus, interdum ad discum leviter depressus vel ad marginem undulato-lobatus, olivaceo-brunneus vel obscure viride-olivaceus, siccitate ochraceus vel sordide luteolus interdum leviter rufulo- vel fulvo-tinctus, jove pluvio exstriatus vel solum ad marginem striatus, jove sicco minute velutino-pruinosus vel flocculosus. Lamellae adnatae vel subdecurrentes, interdum emarginatae fere planae vel juxta stipitem leviter ventricosae, pallide olivaceae vel sordide olivaceo-luteolae dein obscuriore olivaceo-brunneae, aliquantum confertae, L 20–40 l (1)3–7(14), ad aciem pallidiore flocculosae. Stipes 10–40/1½–6 mm., aequalis vel infra leviter incrassatus, interdum compressus vel tortuosus, pileo concoloratus vel pallidiore coloratus, totus flocculoso-pruinosus senectute brunneo-fibrilloso striatus, ad apicem interdum a lamellis striatus, cavus ad basim albo-tomentosus. Caro albida interdum juxta lamellas vel sub cuticula pilei olivaceo-brunneo tincta. Odor debilis vel admodum fortis, gratus, spirituoso-aromaticus. Sporae phaseoliformes vel ellipsoideae, laeves, (7)7½–10(11)/(4)4½–5½ μ (Fig. 397). Basidia 4-sporigera, 24–32/6–8 μ. Cystidia aciei lamellarum diversiformia, vulgo cylindrico-flexuosa vel lageniformia, interdum infra apicem incrassata, rariore ad apicem clavato-capitata, 38–76/5–11 μ ad apicem 4–6 μ lata vel ad apicem capitatam 6–14(18) μ lata. Pili stipitis subcylindrici interdum ramosi, 4–8 μ lati, 20–30 μ prominentes; pili pilei clavato-fusiformes vel lageniformes, ca. 30–100/12–24 μ.

Ad truncos Fagi, Juniper Hill, Mickleham, Surrey, 5 Oct. 1952 et 12 Oct. 1952 (typus in Herb. Kew.); ad truncos Quercus ilicis, Allerford Wood, Bossington, Somerset, 7 Nov. 1959. A N. centunculo sporis majoribus, pileo jove pluvio minus striatus vel exstriatus, statura robustiore, odore interdum spirituoso-aromatico differt. (Sporae N. centunculae 6–8/4–5 μ.)

Cap 10–40 mm., convex then expanded or expanded-convex, sometimes slightly depressed at centre or with wavy-lobed margin in larger specimens, *olive-brown or deep greenish olive*, drying ochraceous or buff sometimes with slight reddish or tawny tinge, when moist *not striate or striate at margin only*, when dry minutely velvety pruinose or flocculose. *Gills* adnate or subdecurrent, sometimes emarginate but ± plane or slightly ventricose near stem, pale olive or olive-buff then deeper olive-brown, rather crowded, L 20–40 l (1)3–7(14), edge paler flocculose. *Stem* 10–40/1½–6 mm., equal or slightly thickened below, sometimes compressed or twisted, concolorous or paler, *entirely floccose-pruinose then brownish fibrillose-striate* when old, apex sometimes striate from gills, hollow, base white tomentose. *Flesh* whitish or sometimes tinged olive-brownish over gills or under cap cuticle. *Smell* faint to *rather strong*, *pleasant*, *spirituous-aromatic*. *Spores* phaseoliform or ellipsoid (7)7½*–10(11)/(4)*4½–5½ μ (Fig. 397). *Basidia* 4-spored, 24–32/6–8 μ. *Marginal cystidia* variously shaped, mostly cylindric-flexuose or lageniform, sometimes swollen below apex, more rarely clavate-capitate at apex, 38–76/5–11 μ, apex 4–6 μ diam., or when capitate 6–14(18) μ diam. Hairs on stem subcylindric, sometimes branched, 4–8 μ diam., projecting about 20–30 μ; hairs on cap clavate-fusiform or lageniform, *ca.* 30–100/12–24 μ.

On beech log, Juniper Hall, Mickleham, 5 Oct. 1952; on same log, 12 Oct. 1952 (type in Herb. Kew); on *Quercus ilex* logs, Allerford Wood, Bossington, Som., 7 Nov. 1959; on oak and ash logs, Horner Water, Som., 8 Nov. 1959. Differs from *N. centunculus* (spores are 6–8/4–5 μ) in the longer spores, less strongly striate moist cap which tends to dry with a tawny tinge, more robust stature and in sometimes having a strong spirituous-aromatic smell. This is probably *N. centunculus* f. *luxurians* Romagn. (BSMF, **58** (1942), 129), judging by the spore size he gives (7½–9/4½–5½ μ). In view of the clear spore-size difference between *centunculus* and *sumptuosa*, which I have found to be consistent so far, as well as the different habitat and colours, I have described the latter as a new species.

Naucoria zetlandica sp.nov. (Figs. 336, 458)

Pileus 8–25 mm., e convexo expanso-convexus, interdum leviter depressus vel ad marginem undulatus, fulvo-umbrinus, obscure fulvo-mellinus vel fere castaneus, senectute minus clare coloratus, siccitate pallide ochraceus vel sordide luteolus, a disco marginem versus exsiccans, jove pluvio striatus et juventute leviter viscidus, ad marginem primo velo albo appendiculato interdum dentato-squamuloso. Lamellae adnatae interdum dente decurrentes, ± ventricosae, aquose sordide luteolae vel pallide mellinae dein pallide fulvo-mellinae postremo ochraceo-mellinae vel colore sucini tinctae, subdistantes, L 16–26 l 1–3(7), ad aciem albido dein pallidiore flocculosae. Stipes 25–135/1½–3 mm., aequalis vel ad basim incrassatus (< 7 mm. crassus), saepe flexuosus, mellinus vel fulvo-mellinus dein colore sucini tinctus vel umbrinus, siccitate haud pallidiore coloratus, primo e velo albo sericeo-floccoso annuloso-zonatus et infra interdum sparse maculatus dein glabrescens, cavus, ad basim leviter tomentosus. Caro concoloratus. Odor et sapor nulli. Sporae ellipsoideo-oblongae vel ellipsoideae, poro germinativo indistincto, laeves, 11–15/7–9(9½) μ (Fig. 336). Basidia 4-sporigera, 36–44/9–11 μ. Cystidia aciei lamellarum vulgo cylindrico-flexuosa interdum hac atque illac incrassata vel lageniformia, 36–82/5–20(28) μ ad apicem 4–16(20) lata (Fig. 458). Cystidia faciei lamellarum nulla. Cellulae cuticulae pilei (1) anguste cylindricae, hyalinae, fere gelatinosae, 1–6 μ latae, stratum tenue formantes; (2) subcylindricae, leviter fusiformes vel curvatae, interdum ramosae, subinde incrustato-pigmentatae, raro fibulatae, 6–16(20) μ latae.

Inter Sphagnos: Grimister, Yell, Shetlands, 25 July 1958 (typus in Herb. Kew.); Downwood, Shobdon, Herefordshire, 24 et 31 Oct. 1959. N. stagnina proxime accedit, sed a sporis leviter brevioribus, pileo jove pluvio visciduIo, lamellis adnatis vulgo ventricosis differt. A sporis magnis in cumulo fusco-cinnamomeis, characteribus cuticulae pilei et habitatione maxime insignis, sed inter Pholiotas et Naucorias constituit. N. stagninoides coloribus obscurioribus, basidiis majoribus, velo tenue mox fugace et habitatione differt.

Cap 8–25 mm., convex then expanded, sometimes slightly depressed or with wavy margin, expanding fully only when quite old, tawny-date-brown or deep tawny-honey to almost chestnut, duller when old, drying pale ochraceous or dirty yellowish from centre, striate when moist, slightly viscid when fresh, margin with appendiculate white veil at first, which sometimes forms dentate scales at edge. *Gills* adnate, sometimes with slight tooth, ± ventricose, watery buff or pale honey then pale tawny-honey, finally ochre-honey to almost amber, subdistant, L 16–26 l 1–3(7), edge whitish then paler flocculose. *Stem* 25–135/1½–3 mm., equal or thickened at base (< 7 mm. diam.), often flexuose, honey or tawny-honey then tinged vandyke or almost amber, only slightly paler when dry, apex with silky floccose ring-zone from veil at first and sometimes a few scattered patches below this, otherwise ± smooth, veil traces disappearing with age, hollow, base slightly whitish tomentose. *Flesh* concolorous. *Smell* and *taste* none. *Spores* ellipsoid or ellipsoid-oblong without visible or with indistinct germ pore, smooth, 11–15/7–9(9½) μ (Fig. 336), snuff-brown to cigar-brown in mass. *Basidia* 4-spored, 36–44/9–11 μ. *Marginal cystidia* cylindric-flexuose, sometimes slightly swollen at base or apex or intermediately, or lageniform, 36–82/5–20(28) μ, apex 4–16(20) μ (Fig. 458). *Facial cystidia* absent. Cap cuticle of (1) a thin layer of narrow hyaline almost gelatinized hyphae, 1–6 μ diam., (2) hyphae with cylindric or slightly fusiform or sausage-shaped cells 6–16(20) μ diam., often encrusted pigmented, sometimes branched or occasionally clamped. Hyphae of veil 3–6 μ diam., hyaline, clamped.

In *Sphagnum*, Grimister, Yell, 25 July 1958 (type in Herb. Kew).

In some ways this resembles *N. stagnina*, which differs in having relatively slightly longer narrower spores (Fig. 337), gills adnate with tooth or subdecurrent and arcuate or triangular, rarely very slightly ventricose, cap not viscid when moist, and stem perhaps blacker in the lower part. *N. stagninoides* has similar spores to *N. zetlandica* though seemingly with a more marked germ pore, but differs in the darker colours, larger basidia, veil slight and soon fugacious and habitat not in *Sphagnum*. By cap cuticle characters and colour of spore print *N. zetlandica* seems a good species of *Naucoria*, perhaps resembling *N. pseudo-amarescens* most closely macroscopically, which is also bright coloured and has a layer of narrow slightly gelatinized hyphae on the cap, whilst the spores are much more like those of *N. stagninoides* but with indistinct germ pore. *N. zetlandica* seems to have a better developed veil than any other species of *Naucoria* sensu stricto known to me, which suggests *Pholiota*, but the hygrophanous cap and cap cuticle characters forbid me placing it in that genus; in any case I do not think the veil is so strongly diagnostic in these small brown-spored agarics (e.g. both *Conocybe* and *Galerina* include species with the veil forming a ring and others without veil). I have therefore placed it in *Naucoria* for the present. It is readily recognizable by the large spores, snuff-brown spore print, cap cuticle characters and bright colours. *N. stagnina* has so far been collected only from high ground at more than *ca.* 1000 ft. above sea-level, whereas *N. zetlandica* seems to be a lowland species.

NOLANEA

I have not yet done enough field work on this genus to undertake a thorough revision, but as an interim measure I include two short keys:

(1) To those species with sepia or vandyke colours, smelling of meal, most commonly found in grass in fields but also sometimes in woods. I have transferred *Entoloma sericeum* to *Nolanea* since I so often find in fields an agaric which I take to be *E. sericeum* s. Fries, excellently depicted by J. Lange, but which I find most frequently indistinguishable in shape from other *Nolanea* spp., as for example *N. staurospora*. The characters underlined by Fries for *Agaricus sericeus* are stem 'fibrilloso' and cap colour 'umbrinus'. J. Lange figures just the right shade of brown with a slight hint of red in it, and I have been aided in recognizing this as Fries's species by the stem, which is very fibrillose and soon becomes fragile and splits lengthwise (a cartilaginous stem tends to snap cleanly across). Probably this is why Fries placed it in *Entoloma* rather than in *Nolanea*, the diagnosis of which includes the words 'stipite cartilagineo'. I am afraid this is where the use of this character breaks down and I feel that *E. sericeum* s. J. Lange is better regarded as a *Nolanea* with a fibrillose stem, a feature also found in *N. cetrata*. I think that more than two species have been put under *E. sericeum* in the past, in fact I have seen at least three with quite different spores so named in the field in recent years—*N. sericea* s. J. Lange and the two I have described as *N. radiata* and *N. farinolens*.

Examination of spores is vital before naming these dull-coloured rather featureless agarics.

(2) To the small group of *Nolanea* spp. with marginal subcylindric cystidia, often swollen below and sometimes subcapitate (as in Fig. 454), and frequently with a characteristic cucumber-like smell. I have finally come to the conclusion that these are best limited to three species, *N. hirtipes*, *N. mammosa* and a new one, *N. tenuipes*. For a long time I used to name the last *N. papillata*, not realizing that this is without marginal cystidia; *N. tenuipes* will be found described as *N. papillata* in the notebooks of A. A. Pearson. I do not feel that the treatment of Kühner & Romagnesi is satisfactory for this group since there is a clear-cut distinction in spore size to separate *N. hirtipes* from the other two. Another source of confusion is that *N. tenuipes*, as I have at last come to realize, does not always have the cucumber smell though the other two do. Previously I had most frequently met only single specimens in the Surrey woods; the examination of a good collection from Surlingham, Norfolk, demonstrated the inconstancy of the smell to me.

Key to Nolanea (*in part*)

Species with mealy smell (and taste), cap convex, umbonate or papillate or not, mostly expanded only when old, and sepia, vandyke or umber when moist, drying silky-shiny and paler

1. Cap (and stem) umber or vandyke tinged red-brown; stem fibrillose-fragile or cartilaginous **2**

1. Cap (and often stem, which may be paler) sepia, grey-horn or vandyke; stem always ± cartilaginous **3**

2. Stem fibrillose-fragile, splitting lengthwise easily; spores subglobose or broadly ellipsoid-angular, (8)9–11/(6½)7–9 μ (Fig. 340); gills rather crowded, whitish or paler than cap *sericea*

2. Stem cartilaginous, snapping across easily rather than lengthwise; spores subglobose isodiametric, 8½–10½/7½–8½ μ; gills subdistant, almost as dark as cap and stem *juncina*

3. Spores stellate, conspicuously nodulose *staurospora*

3. Not so **4**

4. Spores subglobose or broadly ellipsoid (Figs. 338, 339, 341, 343); gill edge fertile, marginal cystidia absent or very rare **5**

4. Spores more elongate ellipsoid (Figs. 335, 342, 347); gill edge fertile or sterile **9**

5. Fruit bodies consistently small with slender stem; cap 4–16 mm., stem ½–1½(2) mm. diam.; spores 8–11½/6½–8(9) μ (Fig. 343); cap pale grey or grey-horn with darker sepia or vandyke centre and conspicuous darker striae; gills whitish at first; smell often faint; especially common under alders but also in other woods *minuta*

5. Most fruit bodies larger with more robust stem; cap (10)15–35(50) mm., stem (1)1½–5 mm. diam. **6**

6. Spores 8–10½(11½)/7–8½ μ (Fig. 339); stem smooth or white silky striate **7**

6. Spores 6½–10/5½–7(7½) μ (Figs. 338, 341); stem usually markedly if finely white silky striate at least when fresh **8**

7. Stem fairly robust, 2–5 mm. diam. for cap 14–40 mm.; gills subcrowded, grey or grey-horn at first then pinkish grey; cap entirely dark sepia when moist; spores subglobose or broadly ellipsoid, 8–10½(11½)/7–8½ μ (Fig. 339); in grass *radiata*

7. Stem more slender, 1–3 mm. for cap 10–30 mm.; gills subdistant, almost as dark as cap and stem; cap and stem vandyke or umber; spores subglobose or isodiametric, 8½–10½/7½–8½ μ; usually on soil in woods, sometimes in grass *juncina*

8. Cap with cuticle rather tough and cartilaginous when fresh and often exceeding gills, convex then expanded or slightly depressed, sometimes slightly obtusely umbonate, sepia-horn or dark sepia, often blackish sepia at centre when moist; spores slightly smaller and with more rounded angles, 6½–9(10)/5½–7(7½) μ (Fig. 341); in woods on soil or in grass in shady places *farinolens*

8. Cap cuticle thin and soon fragile, sepia or sepia-horn often with paler margin when moist, convex or conico-convex, expanding only when quite old, obtusely umbonate or papillate; spores slightly larger and with more marked angles, 7½–10/5½–7(7½) μ (Fig. 338); in grass in fields; sometimes more robust (cap 50 mm. and stem 5 mm. diam.) *lucida*

9. Consistently small; cap 7–14 mm., stem ½–1½ mm. diam.; marginal cystidia present, cylindric-flexuose, clavate or lageniform, 28–45/5–12 μ, apex when obtuse 4–7 μ; spores (9)10–12/5½–6½(7) μ (Fig. 342); cap dirty buff or horn colour, often with sepia papilla, striate to centre when moist; taste often none or faintly mealy only; in woods in damp places *tenella*

9. Most specimens larger with more robust stem; cap 15–50, stem 1–3 mm. diam.; marginal cystidia present or absent **10**

10. Gill edge sterile, marginal cystidia cylindric-flexuose, often subcapitate or slightly swollen in lower part, 25–45/5–9 μ; gills white or whitish at first; in woods or shady places; spores 9–11/5½–6½ μ, ellipsoid-oblong (Fig. 347); cap 15–50 mm., convex then expanded often papillate, sepia-horn then paler grey-horn with darker centre when moist; stem 30–100/1–3 mm., grey-horn, silky-fibrillose striate, rather tough and cartilaginous *hebes*

10. Gill edge fertile, marginal cystidia absent or very rare; gills whitish or pale grey or sepia-grey at first; in grass or moss **11**

11. Cap and stem relatively pale; spores 8–9½/6–7½ μ; cap 18–35 mm., grey-horn, soon expanded plane or slightly depressed, sometimes slightly minutely silky-scaly at centre not or scarcely striate when moist; stem pale grey-horn, smooth and shining, sometimes compressed or channelled, cartilaginous; gills whitish then pale brownish pink *fernandae*

11. Cap and stem relatively dark; spores 9–12/6½–8 μ (Fig. 335); cap 12–28 mm., persistently conical or convex, expanded-convex only when quite old, papillate or with small obtuse umbo, dark sepia or vandyke striate when moist; stem concolorous or paler at apex, smooth or slightly white silky-striate with white-pruinose apex, rather stiff and brittle; gills pale grey, soon grey-horn or pale sepia then brownish pink *papillata*

Species with marginal cystidia (*as in Fig.* 454), *smell often of cucumber or fishy but not mealy*, *cap dark sepia or vandyke* or *sepia-horn when moist*, *in woods or in grass*

1. Spores 11–14(15)/(6½)7–8 μ, elliptic-oblong in outline (Fig. 344); relatively robust agaric of coniferous woods (usually in plantations in Britain); cap 28–52 mm. or more; stem 70–150/2–5 mm. (3–10 at base); cucumber smell well-marked; in my experience appears late in the season; cap colour yellowish-horn when drying *hirtipes*

1. Spores shorter (Figs. 345, 346); more slender habit; habitats various **2**

2. Spores 10–12½/7–8 μ, elliptic in outline (Fig. 345); in grass in fields or more rarely in woods; cucumber smell well-marked; stem not or only slightly white-striate; cap 10–30 mm. *mammosa*

2. Spores (8)9–11½(12)/5½–6½(7) μ, elliptic-oblong in outline (Fig. 346); woodland species on soil especially under dog's mercury, but also elsewhere; cucumber smell or not; stem markedly white silky-striate at least when young and fresh, often rather long and thin; cap 9–25(32) mm. *tenuipes**

* For synonymy see 'Check List'. One collection with cap dark sepia and slight cucumber smell was made in beech leaves at Wind Down Wood, Enmore, Som., 11 Aug. 1958, which I believe to be *N. proletaria* s. Ricken non al. with spores isodiametric subglobose, 8–10/7–8 μ, but I wish to gather more material before renaming this, if that is necessary.

NOLANEA CUNEATA Bres., *Fungi Tridentini*, 1 (1887), 77, Pl. 82^2 (Figs. 143–144, 348)

Whilst walking in pine woods at Rothiemurchus, Inverness-shire in 1956 I was struck by the unusual appearance of a number of specimens of '*N. cetrata*' which were growing there; when moist they had a curious pale yellowish spot in the centre of the nearly always rather conical cap. I was surprised to find that unlike true 2-spored *N. cetrata* they had 4-spored basidia. I made further collections from similar localities in other parts of the country, all picked out by this pale central spot. Typical *N. cetrata* from the same areas with no central spot on the cap invariably had 2-spored basidia. When checking through Bresadola's *Iconographia* I recognized the former fungus as that described by him as *N. cuneata*. Though this has some features in common with *N. cetrata* (namely, tendency to yellowish colours, fibrous-fragile stem and habitat in coniferous woods) I prefer to regard *N. cuneata* as distinct because of (1) the pale central spot on the cap, permitting field identification, and (2) the spores from 4-spored basidia are the same size as those of *N. cetrata* from 2-spored basidia; if this were a 4-spored form of *N. cetrata* I should expect the spores to be smaller.

Cap 23–45 mm., conical or conico-convex, scarcely expanding, papillate or obtusely umbonate, *sepia-horn or deep sepia* often with paler buff or dirty yellowish tinge at margin, *papilla or umbo pale yellowish even when moist*, drying ± unicolorous pale dirty buff and silky shiny, striate when moist. *Gills* free, pale clay-sepia or with slight dirty yellowish tinge then pinkish brown, subcrowded, L 24–30 l 1–3. *Stem* 80–110/3–5 mm., equal or slightly attenuated upwards, *pale dirty yellowish-buff or ochraceous-buff*, sometimes more yellowish at base, *fibrous-fragile*, apex white pruinose, remainder slightly white silky-striate, stuffed then hollow. *Smell* none or faint pleasant. *Spores* broadly ellipsoid angular, *10–12/7–8 μ* (Fig. 348). *Basidia 4-spored. Gill edge* fertile.

Under conifers (especially pine): Rothiemurchus, Inverness-shire, 25 Sept. 1956; Loch Craiglush (under birch, but pines near—50 yards or so), Dunkeld, Perthshire, 3 Oct. 1956; Stormont Loch, Blairgowrie, Perthshire, 4 Oct. 1956; Elstead, Surrey, 15 Oct. 1956.

Nolanea farinolens sp.nov. (Figs. 145–147, 341)

Pileus 14–30 mm., convexo dein expanso-convexus nunc planus vel leviter depressus, nunc persistente expanso-convexus, interdum leviter obtuse umbonatus, obscure fuscus vel sepius, vulgo ad discum nigro-fuscus, siccitate pallide griseo-brunneus vel sordide brunneolus, jove pluvio striatus, jove sicco sericeo-nitidus, ad marginem interdum lamellas excedens, cuticula primo interdum fere lente vel flexibile. Lamellae adnatae interdum emarginatae vel subdecurrentes, ex albido-griseo griseo-incarnatae dein brunneolo-incarnatae, subdistantes vel subconfertae, L 16–20 l 3–7, ad aciem fere integrae. Stipes 20–70/$1\frac{1}{2}$–2 mm., aequalis vel ad basim incrassatus, pileo concoloratus vel pallidiore sepius, minute albo-sericeo saepe interrupte striatus, e farcto cavus, ad basim albo-tomentosus, admodum lentus et cartilagineus. Caro concolorata, siccitate intus albida. Odor saltem secto et sapor forte farinacei. Sporae subglobosae vel late ellipsoideae, obtuse angulatae, $6\frac{1}{2}$–9(10)/$5\frac{1}{2}$–7($7\frac{1}{2}$) μ (Fig. 341). Basidia 4-sporigera. Acies lamellarum fertilis.

In silvis ad terram vel inter graminos, vulgatus, saepe gregarius: Plodda Falls, Guisachan, Inverness-shire, 22 Aug. 1955 (typus in Herb. Kew.); Thack Marsh, Surlingham, Norfolk (in alnetis), 17 July 1956. Sporis aliquantum parvis obtuse angulatis, odore forte farinaceo et coloribus griseo- vel nigro-fuscis insignis. N. radiata, N. lucida a sporis majoribus vel acutiore angulatis et probabiliter habitatione in pratis dignoscunitur.

Cap 14–30 mm., rather variable in shape, convex then expanded-convex, either becoming plane or slightly depressed or remaining expanded-convex, sometimes slightly obtusely umbonate, *sepia-horn or dark sepia often blackish sepia at centre*, drying pale horn or pale greyish brown to dirty buff, striate when moist, silky shiny or with silky sheen when dry, margin sometimes exceeding gills, *cuticle at first often rather tough and flexible. Gills* adnate, sometimes emarginate or subdecurrent, *whitish grey then greyish pink* finally brownish pink, subdistant or subcrowded, L 16–20 l 3–7, edge ± even. *Stem* 20–70/1½–3 mm., equal or slightly thickened at base, *concolorous or paler*, minutely and often interruptedly white silky striate, apex often white pruinose, stuffed, then hollow at least at apex, base white tomentose, *rather tough and cartilaginous* when fresh. *Flesh* concolorous, drying whitish in centre. *Smell, at least when cut*, and taste strong mealy, *Spores subglobose or broadly ellipsoid angular, angles rather rounded, 6½–9/5½–7(7½)* μ (Fig. 341). *Basidia* 4-spored. *Gill edge* fertile.

In woods on soil or in grass in shady places. Common and often gregarious. Badger Falls, Glen Affric, 19 Aug. 1955; Plodda Falls, Guisachan, Inverness-shire, 22 Aug. 1955 (type in Herb. Kew); Thack Marsh, Surlingham, 17 July 1956; Tarn House Plantation, Malham, Yorks, 30 Aug. 1958.

Distinguished by rather tough cap cuticle, dark sepia or blackish colours, strong mealy smell and rather small spores with some rounded angles. *N. lucida* is paler and more fragile, has slightly larger spores with more marked angles and grows in grass. *N. vinacea* has similar spores but is inodorous and the stem turns yellowish with age. I am surprised I have not been able to find this rather characteristic species in recent agaric literature. It is, however, essential to pay critical attention to the spores, which was the feature that made me first realize this was likely to be something different. A collection from Gannochy, Glenesk, Kincardineshire, 5 Sept. 1955, was at first figured by mistake as *N. farinolens* (Figs. 148, 149), but is more likely to be *N. lucida* from the description and camera lucida spore drawings—a case in point, I had failed in the first place to examine the spores carefully!

Nolanea lucida sp.nov. (Figs. 150–155, 338)

Pileus 10–38(50) mm., e conico vel conico-convexo expanso-convexus vel fere planus, saepe primo papillatus sed nunc obtuse umbonatus nunc sine umbone, fuscus vel sepius, vulgo ad discum obscuriore vel ad marginem pallidiore coloratus, siccitate pallide sordide luteolo-brunneus vel pallide fuscus, jove pluvio ad marginem striatus, jove sicco radialiter obscuriore lineatus dein forte sericeo-nitidus. Lamellae adnatae vulgo anguste adnatae, interdum profunde emarginatae, ± ventricosae, ex albido-griseo vel colore cornus pallide tincto griseo-incarnatae dein brunneolo-incarnatae, subconfertae, L 18–26 l 1–3, ad aciem fere integrae. Stipes 20–62/1–3(5) mm., aequalis, albido-griseus vel pallide fuscotinctus, juventute minute sericeo-striatus, ad apicem albopruinosus, e farcto cavus, juventute ± cartilagineus, ad basim vulgo albo-tomentosus. Caro concolorata, juxta lamellas et in cortice stipitis colore cornus tincta, siccitate intus albida. Odor saltem secto et sapor farinacei. Sporae late ellipsoideae vel fere subglobosae, acute angulatae, 7½–10/5½–7(7½) μ (Fig. 338). Basidia 4-sporigera. Acies lamellarum fertilis.

In pratis, Membury, Devon, 1 Nov. 1957 (typus in Herb. Kew.). N. radiata proxime accedit, sed a sporis angustioribus et statura graciliore differt. N. farinolens a cuticula pilei lentiore, coloribus obscurioribus, sporis minus angulatis et habitatione in silvis differt. N. sericeonitens a sporis latioribus absentia odoris farinacei distinguitur. N. fernandae a sporis longioribus, coloribus pallidioribus differt.

Cap 10–38(50) mm., conical or conico-convex then expanded-convex or plane, often papillate at first but sometimes broadly umbonate or without umbo, *sepia-horn or dark sepia, often with darker centre*, sometimes paler at margin, pallid-buff or pale sepia when dry, striate at margin when moist, *with strong silky shiny sheen when dry*, often radially darker streaky when half-dry. *Gills* adnate sometimes narrowly so, sometimes deeply emarginate, ± ventricose, *whitish grey or pale horn then greyish pink* finally brownish pink, subcrowded, L 18–26 l 1–3, edge ± even. *Stem* 20–62/1–3(5) mm., equal, *whitish grey, pale grey-horn or tinged sepia*, minutely silky striate when fresh, apex white pruinose, stuffed then hollow, ± cartilaginous when fresh, base often white tomentose. *Flesh* concolorous, horny over gills or in cortex of stem, drying whitish in centre. *Smell* at least when cut and *taste* strong *mealy. Spores broadly ellipsoid or almost subglobose*, angular, angles well marked, 7½–10/5½–7(7½) μ (Fig. 338). *Basidia* 4-spored. *Gill edge* fertile.

In fields: Bossington, Som., 30 Oct. 1957; Membury, 1 Nov. 1957 (type in Herb. Kew); Clapham, Yorks, 27 Aug. 1958.

Resembling *N. radiata* most closely but with narrower spores and usually of more slender stature. I was at first doubtful about separating this from *N. radiata* but have ventured to do so in view of the spore difference. *N. farinolens* differs in the cap with tougher cuticle and darker colours when moist, spores with more rounded angles and habitat in woods or shady places. *N. sericeonitens* is somewhat similar macroscopically but is without mealy smell or taste and has broader spores. *N. fernandae* has longer spores and is paler.

NOLANEA RADIATA (J. Lange) P. D. Orton (see p. 179 and Figs. 156–158, 339)

Whilst attempting to sort out the problem of *E. sericeum*, I rather frequently came across a mealy-smelling agaric, especially in the south of England, with dark sepia moist cap but a rather tough and cartilaginous stem and subglobose angular spores. This I think is the same as *Rhodophyllus* (*Entoloma*) *radiatus* (J. Lange) J. Lange, though he did not state that his fungus had a mealy smell or taste and he gave a slightly different habitat. His description otherwise fits my specimens quite well so that I am using his epithet but transferring it to *Nolanea*. Here is a description of my interpretation of *N. radiata*:

Cap 14–40 mm., convex soon expanded-convex, often obtusely umbonate but sometimes without umbo, *sepia-horn to dark sepia*, sometimes paler or tinged buff at margin, drying pale sepia or pallid-buff from centre out, *striate* when moist, radially darker streaky when half dry, with slight silky sheen when dry, margin often retaining darker colour for a long time when drying. *Gills* narrowly adnate or almost free, often emarginate and broad near stem, *grey or grey-horn then brownish pink*, subcrowded, L 20–36 l 1–7, sometimes veined at base or interveined in larger specimens, edge even or slightly uneven. *Stem* 14–45/2–5 mm., equal or slightly thickened at base or apex, often compressed or channelled, *pale grey-horn or sepia-horn* drying paler, apex white pruinose, remainder minutely white silky striate (sometimes interruptedly so), stuffed then hollow, base often white tomentose, *rather tough and cartilaginous* when fresh. *Flesh* concolorous, thin except at centre of cap, drying whitish inside. *Smell* and *taste* strong *mealy. Spores subglobose* almost isodiametric or very broadly ellipsoid angular, 8–10½(11½)/7–8½ μ (Fig. 339). *Basidia* 4-spored. *Gill edge* fertile.

In fields: Dawlish Warren, Devon, 27 Oct. 1956 and 24 Nov. 1956; Berrow, Som., 26 Nov. 1956; Membury, Devon, 2 Nov. 1957; Juniper Hill, Mickleham, Surrey, 27 Nov. 1953. This could perhaps be placed in *Entoloma* on account of the relatively robust stem in relation to size, but since the stem is cartilaginous and the general facies is that of *Nolanea* I prefer to transfer it. It differs from *N. sericea* in being always sepia and duller in colour and the cartilaginous stem. *N. lucida* and *N. farinolens* have narrower spores and are more slender.

Nolanea sericeonitens sp.nov. (Fig. 349)

Pileus 20–40 mm., e convexo expansus, saepe papillatus, obscure fuscus vel sepius, siccitate pallide sordide ochraceus ad marginem persistentiore obscuriore coloratus, jove pluvio ad marginem striatus, jove sicco manifeste radialiter sericeo-fibrillosus, interdum postremo radialiter fissuratus. Lamellae adnatae, vulgo anguste adnatae et profunde emarginatae, e pallide griseo-brunneo griseo-incarnatae dein brunneolo-incarnatae, subdistantes, L ca. 24 l 3(5), interdum leviter venosae, ad aciem integrae vel undulatae. Stipes 25–60/1½–3 mm., aequalis vel ad basim leviter incrassatus, rariore compressus vel canaliculatus, fere concoloratus, leviter sericeo-striatus, e farcto cavus, ad basim albo-tomentosus. Caro pileo concolorata, siccitate intus pallidiore colorata. Odor nullus. Sapor nullus vel debilis non farinaceus. Sporae late ellipsoideae acute angulatae, 9–11/7–8 μ (Fig. 349). Basidia 4-sporigera. Acies lamellarum fertilis.

In pratis, Dawlish Warren, Devon. 12 Dec. 1956 (legit T. J. Wallace; typus in Herb. Kew.). Coloribus fuscis, absentia odoris et saporis farinaceorum, pileo jove sicco manifeste sericeo-fibrilloso, sporis late ellipsoideis angulatis insignis. N. proletaria sensu Bres. non al. idem censeo.

Cap 20–40 mm., convex then expanded, often papillate, *sepia-horn or dark sepia*, drying pale pallid-ochraceous, striate at margin when moist, *markedly radially silky-fibrillose when dry*, margin often remaining darker for some time when drying, sometimes becoming radially split. *Gills* adnate, often narrowly so and deeply emarginate near stem, grey-horn then grey-pinkish finally brownish pink, subdistant, L *ca.* 24 l 3(5), sometimes slightly veined at base, edge even or becoming wavy. *Stem* 25–60/1½–3 mm., equal or slightly thickened at base, occasionally compressed or grooved, ± concolorous, slightly silky striate, stuffed then hollow, base white tomentose. *Flesh* concolorous, drying paler in centre of cap and stem. *Smell none. Taste none* or faint, *not* mealy. *Spores broadly ellipsoid angular*, 9–11/7–8 μ (Fig. 349), angles well marked. *Basidia* 4-spored. *Gill edge* fertile.

In fields, Dawlish Warren, 12 Dec. 1956 (legit T. J. Wallace; type in Herb. Kew). Recognized by lack of mealy smell and taste, dull colours, markedly silky dry cap and broadly ellipsoid angular spores. I think this is *N. proletaria* (Fr.) Gillet s. Bres. non Fr., Boudier, Ricken, though Bresadola does not mention a papillate cap and says 'centro villoso' which was not so in my specimens. Differs from *Rhodophyllus nitens* s. Kühn. & Romagn. in stature, but may be the same; *N. nitens* Vel., of coniferous woods with isodiametric spores 10–12 μ, suggests another species.

Nolanea tenuipes sp.nov. (Figs. 159–161, 346, 454)

Pileus 9–25(32) mm., e conico-convexo vel convexo expansus, vulgo papillatus, rariore senectute leviter umbilicatus, fuscus vel sepius, vulgo ad discum obscurior, siccitate pallide griseo-brunneus vel sordide luteolo-brunneus, jove pluvio striatus, jove sicco sericeo-nitidus, ad marginem interdum senectute lobatus. Lamellae adnatae, vulgo anguste adnatae, interdum ventricosae, ex albido griseae vel griseo-incarnatae dein brunneolo-incarnatae, subconfertae, L 18–32 l 3–7, ad aciem interdum minute flocculosae. Stipes 40–105/1–3 mm., gracilis, aequalis vel ad basim incrassatus (< 5 mm. latus), pileo concoloratus vel pallidiore fuscus, manifeste albosericeo-striatus, ad apicem albo-pruinosus, e farcto cavus, ad basim albo-tomentosus, primo cartilagineus et flexibilis postremo fragilior. Caro concolorata, intus albida. Odor nullus vel aliquantum fortis, odori cucumeris similis. Sapor aliquantum rancido-oleaceus. Sporae ellipsoideo-oblongae angustae, (8)9–12/5½–6½(7) μ (Fig. 346). Basidia 4-sporigera. Cystidia aciei lamellarum cylindrico-flexuosa interdum subcapitata, raro ad apicem fere acuta, 24–40/6–8(10) μ ad apicem 5–8 μ lata (Fig. 454).

In silvis praecipue ad terram humidam, Friston, Sussex, 17 Nov. 1957 (typus in Herb. Kew.). Sporis admodum angustis, stipite flexibile manifeste albosericeo-striato lamellis subconfertis, insignis. N. mammosa a sporis latioribus, habitatione in pratis, statura robustiore differt.

Cap 9–25(32) mm., conico-convex or convex, then expanded, usually papillate, occasionally becoming expanded-plane and slightly umbilicate when old, *sepia-horn or dark sepia often darker vandyke at centre*, drying pale horn or pallid-buff, striate when moist, with silky sheen when dry, margin sometimes becoming lobed and puckered in large specimens. *Gills* adnate, often narrowly so, ventricose or not, *whitish then greyish or greyish pink* finally brownish pink, rather crowded, L 18–32 l 3–7, edge sometimes minutely flocculose. *Stem* 40–105/1–3 mm., *slender*, equal or thickened at base (< 5 mm. diam.), concolorous or paler, *markedly white silky striate*, apex white pruinose, stuffed then hollow, base white tomentose, *cartilaginous and pliable at first* later more fragile. *Flesh* concolorous, whitish in centre of cap and stem. *Smell none or fairly strong of cucumber or fishy*. *Taste* rather rancid-oily. *Spores* ellipsoid-oblong angular, (8)9–12/5½–6½(7) μ (Fig. 346). *Basidia* 4-spored. *Cystidia* on gill edge *cylindric-flexuose sometimes subcapitate*, rarely more pointed at apex, 24–40/6–8(10) μ, apex 5–8 μ (Fig. 454).

In woods, usually in damp places, e.g. in moss under dog's mercury: Mickleham Downs, Surrey, 1 Oct. 1954; Norbury Park, Mickleham, Surrey, 2 Oct. 1954 and 14 Oct. 1958; Wheatfen Carr, Surlingham, Norfolk, 18 July 1956; Friston, Sussex, 17 Nov. 1957 (type in Herb. Kew).

I think this is *Rhodophyllus mammosus* var. *tenuis* Romagn. and also var. *obsoletus* Romagn. I have, however, described it under a different name in case I am wrong. I feel quite certain that this species is distinct from *N. mammosa* (see key, p. 329), in my experience most frequently found in grass, which is the habitat given by Fries. It differs also in narrower spores, and from *N. hirtipes* in much smaller spores (Figs. 344–346) and slender habit as well as habitat (coniferous woods). *N. papillata*, another grassland species, has no marginal cystidia and smell none or mealy. *N. tenuipes* is particularly partial to basic soils.

NOLANEA TESTACEA (Bres.) P. D. Orton (see p. 179)

A Nolanea with reddish brown cap was collected under birch and hazel on the Spring Foray of the British Mycological Society in May 1958 at Nant Crafnant, North Wales, in a locality where it was unlikely that conifers had ever been grown. It was identified by me as *N. cetrata* var. *testacea* and resembled *N. cetrata* in many ways, apart from colour, but the latter is usually found under conifers. Another collection was made in Scotland later in the year, again without pines in the neighbourhood. On account of the reddish brown moist cap and possible habitat difference I prefer to regard this as different from *N. cetrata*, which has similar spores and 2-spored basidia, and worthy of specific rank.

Cap 12–22 mm., convex or conico-convex not expanding fully, often broadly or truncately umbonate and sometimes with small central depression, *reddish date-brown or burnt sienna, often with darker centre or paler buff margin*, drying pale dirty buff with slight reddish tinge, striate when moist, silky-shiny when dry. *Gills* adnate, often narrowly so, pale dirty brownish or tinged buff then pinkish buff to brownish pink, sometimes tinged colour of cap especially near flesh of cap, subcrowded, L 24–32 l 3–7. *Stem* 30–66/2–5 mm., equal or slightly thickened at base, *pale dirty brownish or pale buff* (almost colour of edge of moist cap), sometimes tinged reddish brown near base, white silky-striate or fibrillose-striate, *rather fragile* but slightly cartilaginous, apex whitish pruinose. *Flesh* concolorous, deep coloured at centre of cap when moist, paler when dry. *Smell* none. *Taste* none or faint, pleasant. *Spores* rather broadly ellipsoid angular, 9–12/7–8 μ. *Basidia 2-spored. Gill edge* fertile.

Under birch and hazel, Nant Crafnant, Caerns., 17 May 1958; in moss and heather near birches, Tomich, Inverness-shire, 24 Sept. 1958. Differs from *N. cetrata* possibly also in habitat (not under conifers) and less fibrous-fragile stem. Only some sort of cross-cultivation experiment could settle the question of relationship between these two species. On 5 Dec. 1959 at Covenhope, Herefordshire, I found a similar fungus under bracken (but near an *Abies* plantation), which was, however, 4-spored. This awaits further investigation.

Omphalina fusconigra sp.nov. (Figs. 162–166, 350)

Pileus 10–40 mm., e convexo expansus umbilicatus interdum profunde umbilicatus, obscure fuscus vel nigrobrunneus, siccitate sordide luteolo-brunneus, jove pluvio ad marginem striatus, jove sicco opacus vel leviter radialiter lineatus, interdum ad discum leviter rugulosus vel furfuraceo-flocculosus, ad marginem primo involutus dein vulgo leviter crenulatus. Lamellae arcuato- dein profunde-decurrentes, ex albido mox griseo-brunneolae vel griseo-fuscae, subdistantes vel subconfertae L 20–30 l 3(5), ad aciem vulgo obscuriore fuscae. Stipes 30–50/2–6 mm. (compressu < 8 mm.), aequalis vel hac atque illac incrassatus, obscure fuscus vel nigro-brunneus, interdum nitidus sed sub lente minute pubescens, e spongioso-farcto cavus, ad basim interdum albo-tomentosus. Caro pileo concolorata, siccitate pallidiore fusca. Odor nullus vel debilis, gratus. Sapor nullus. Sporae ellipsoideae, 6–9(10)/3½–4½(5) μ (Fig. 350). Basidia 4-sporigera. Cystidia nulla. Pili stipitis subcylindrici hyalini, 50–200+/3–8 μ. Cellulae cuticulae pilei hyalinae vel incrustato-pigmentatae, fibulatae, subcylindricae, 4–8 μ latae.

Inter Sphagnos raro inter muscos alios: Blairdrummond, Perthshire, 28 Sept. 1957 (legit J. Grainger, typus in Herb. Kew.). Ab O. sphagnicola, philonote et onisco coloribus obscurioribus nigrofuscis stipite minute pubescente differt. O. velutipes a statura graciliore habitatione ad terram, pilis stipitis clavatis distinguitur.

Cap 10–40 mm., convex soon expanded, umbilicate sometimes deeply so, *dark vandyke or blackish brown*, drying sepia-buff from centre, *striate at margin* when moist, matt or slightly radially streaky when dry, *sometimes slightly rugulose or scurfy-flocculose at centre*, margin involute at first, then often slightly crenulate. *Gills* arcuate- then deeply-decurrent, whitish when very young, soon *greyish buff or sepia-grey then grey-vandyke*, not or fairly crowded, L 20–30 l 3(5), edge often *darker* vandyke. *Stem* 30–50/2–6 mm. (< 8 when compressed), equal or slightly thickened in places, sometimes compressed, *dark vandyke or blackish brown like cap*, shiny or slightly streaky but *minutely pubescent under lens*, spongy-stuffed then hollow, base sometimes white tomentose. *Flesh* concolorous, drying paler. *Smell* none or faint pleasant. *Taste* none. *Spores* ellipsoid, 6–9(10)/3½–4½(5) μ (Fig. 350). *Basidia* 4-spored. *Cystidia* none. Hairs on stem *subcylindric*, hyaline 50–200+/3–8 μ. Cells of hyphae of cap cuticle subcylindric, 6–14 μ diam., hyaline or encrusted-pigmented (sometimes in spiral bands), clamped, 4–8 μ diam.

Usually on *Sphagnum*, rarely on other mosses: Glenesk, Kincards., 30 Aug. 1952; Keasden Moss, Yorks, 8 Sept. 1952; Blairdrummond, 28 Sept. 1957 (legit J. Grainger, type in Herb. Kew).

Differs from the other sphagnicolous species of *Omphalina* in consistently darker blackish brown cap and stem and minutely pubescent stem. *O. velutipes* is dark but differs in the smaller stature, habitat on soil and clavate hairs on stem. I thought at one time that this might be *O. umbratilis*, but that is described as having the stem 'glaber' and not as growing in mosses. I have been unable to find a description which would fit this rather characteristic sphagnicolous agaric.

OMPHALINA HEPATICA (Fr. ex Fr.) P. D. Orton (see p. 180 and Figs. 167, 168, 351, 455)

Cap 5–20 mm., convex then expanded umbilicate, *dirty pinkish or pinkish buff, less commonly dirty ochraceous without pinkish tint*, drying pale buff ('Tilleul Buff') or dirty brownish, pellucid-striate when wet, sometimes almost sulcate, when dry *at first entirely whitish silky-hoary*, later in outer part only, margin involute at first then often crenate. *Gills* decurrent, often arcuate, *whitish with dirty pinkish tinge then almost colour of half-dry cap* (pale pinkish buff), subdistant, L 14–18 l 1(3), sometimes forked in places or anastomosing, often veined at base, rather thick, with blunt edge. *Stem* 8–20/0·7–2(3) mm., equal or slightly attenuated downwards, often flexuose, concolorous or paler, *entirely minutely pubescent when fresh*, sometimes appearing smooth when old, stuffed-solid, rather tough, base white tomentose. *Flesh* thin, concolorous. *Smell* none. *Taste* none. *Spores broadly ovoid or ellispoid* with oblique apiculus, 5½–7½(*8*)/*4–5* μ (Fig. 351). *Basidia* (2)–4-spored, *ca.* 30–35/7–8 μ. *Cystidia* none. Hyphae of cap cuticle filamentous interwoven, clamped, 4–9 μ diam. Hairs on stem *cylindric-flexuose subcapitate, ca.* 40–80/4–7 μ at apex (Fig. 455).

In grass in field or in sand dunes: Hackhurst Downs, Gomshall, 23 Nov. 1951, 6 Dec. 1953; Dawlish Warren, Devon, 8 Dec. 1956 (legit T. J. Wallace).

Recognized by pale pinkish colours, hoary cap and broadly ovoid spores. This is *Omphalia hepatica* s. Ricken and probably corresponds to *Agaricus subhepaticus*, Batsch (no. 211) for which Fries used the epithet *hepaticus*, but it has nothing to do with *A. hepaticus* Batsch (no. 2). I am sure this has been named *Omphalia pyxidata* in the past and that this accounts for the varying spore details given under that name. *Omphalina pyxidata* differs quite distinctly in the larger ellipsoid-amygdaliform spores, 7½–10/5–6 μ (Fig. 352), smooth or silky striate but not pubescent stem, less hoary more strongly striate cap and slightly more robust habit.

Omphalina velutipes sp.nov.

Pileus 7–20 mm., e convexo expansus haud profunde umbilicatus, griseo-fuscus vel obscure olivaceo-griseus interdum fere niger, siccitate pallide argillaceus, jove pluvio striatus, jove sicco fere glaber, dum exsiccat obscure zonatus, ad marginem interdum leviter crenatus. Lamellae decurrentes ± arcuatae, pallide sordide-brunneolae vel griseo-fuscae, subdistantes, L ca. 14–16 l 1–3, interdum furcatae, aliquantum crassae, ad aciem interdum obscurascens. Stipes 12–25/1–2 mm., ± aequalis, sed ad basim leviter incrassatus vel bulbosus, obscure olivaceo-griseus vel pallide griseo-fuscus, interdum ad apicem vel ad basim pallidiore coloratus, totus minute pubescens. Caro pileo concolorata. Odor nullus. Sporae 6–9(10)/4–6 μ, ovoideae vel late ellipsoideae. Basidia 4-sporigera. Acies lamellarum fertilis, interdum senectute cellulis sterilibus clavatis basidiiformibus. Pili stipitis ± clavati, interdum infra flexuosi, < 80/8–12 μ ad apicem < 20 μ lati, interdum fibulati.

Ad terram, Glen Einich, Inverness-shire, 29 Aug. 1955 (typus in Herb. Kew.). A speciebus gracilibus alteris Omphalinae (ericetorum, rustica (sensu J. Lange), hepatica et velutina) stipite pubescente coloribus obscurioribus pilei stipitisque differt. O. velutina a lamellis albidis basidiis 2-sporigeris distinguitur. O. fusconigra a statura robustiore, habitatione inter Sphagnos vel raro muscos alios, pilis stipitis subcylindricis longioribus distinguitur. Omphalia umbratilis var. minor sensu Fr., F. H. Møller idem est.

Cap 7–20 mm., convex then expanded, not very deeply umbilicate, *grey-horn or dark olive-grey to blackish*, drying pale clay, striate to centre when moist, ± smooth when dry, darker zoned when half dry, margin sometimes crenate. *Gills* decurrent, ± arcuate, *pale pallid or grey-sepia*, subdistant, L *ca.* 14–16 l 1–3, sometimes forked, rather thick, edge sometimes becoming darker. *Stem* 12–25/1–2 mm., ± equal with slightly thickened or bulbous base, *dark olive-grey or grey-horn*, sometimes paler at base or apex, *entirely minutely pubescent. Flesh* concolorous. *Smell* none. *Spores* ovoid or broadly ellipsoid, 6–9(10)/4–6 μ. *Basidia* 4-spored. *Gill edge* fertile at least when young, may have sterile basidiiform cells when old. Hairs of stem ± *clavate*, sometimes flexuose below, < 80/8–12 μ, apex < 20 μ diam., sometimes clamped at base.

On soil, Glen Einich, 29 Aug. 1955 (type in Herb. Kew).

This is *Omphalia umbratilis* var. *minor* (Fr.) F. H. Møller s. Fries, F. H. Møller, which differs from *O. umbratilis* (not well known and needing a modern description) in the pubescent stem as well as smaller stature and seems to be well worth separation. Differs from the other small species of *Omphalina* (*ericetorum*, *rustica* (s. J. Lange), *hepatica*, *velutina*) with pubescent stems in darker blackish cap and stem. *O. velutina* also differs in the whitish gills and 2-spored basidia. *O. fusconigra* is similarly coloured but more robust, grows on *Sphagnum* or rarely other mosses and has longer subcylindric hairs on the stem.

Pholiota aromatica sp.nov. (Figs. 169, 353, 462)

Pileus 20–48 mm., e convexo expansus ± planus, interdum obtuse umbonatus vel senectute leviter depressus vel ad marginem undulato-lobatus, e sulphureo mox praecipue ad discum ferrugineo-tinctus, ad marginem interdum leviter viride-flavo tinctus, postremo fere totus ferrugineus vel ferrugineo-ochraceus, viscidus, pellicula separabile, vulgo squamulis parvis concentricis adpressis fibrillosis ferrugineis ad discum confertiore ad marginem sparsiore obtectus, rariore fere glaber, ad marginem residuis veli pallide flavi decoratus. Lamellae adnatae leviter emarginatae vel dente decurrentes interdum subdecurrentes, haud ventricosae, e pallide flavo olivaceo-flavae dein olivaceo-ferrugineae, confertae, L 50–60 l 3–7, ad aciem pallidiore minute denticulatae interdum obscure ferrugineo-maculatae vel jove pluvio guttas aqueas plorantes. Stipes 25–60/3–10 mm., deorsum attenuatus rariore fere aequalis, pallide flavus mox ad basim sursum ferrugineus vel ferrugineo-ochraceus, velo flaveolo interdum fugace annuloso-zonatus vel prope apicem distincte annulatus, infra fibrilloso-striatus squamulis adpressis fibrilloso-floccosis ferrugineis eis pilei similibus ± concentrico-zonatis obtectus, e farcto cavus, admodum lentus. Caro pilei et ad apicem stipitis sulphurea vel viride flava, ad partem inferam stipitis obscure ferruginea vel fere umbrina ad corticem obscuriore colorata. Odor debilis vel aliquantum fortis, fere tureus. Sporae ellipsoideo-amygdaliformes, laeves, 9–11/4½–5½ μ (Fig. 353), in cumulo obscure ferrugineae. Basidia 4-sporigera, 32–36/7–8 μ. Cystidia aciei lamellarum clavata vel capitato-clavata 18–40/7–14 μ ad apicem (Fig. 462). Cystidia faciei lamellarum nulla. Cellulae hypharum cuticula pilei (1) hyalinae, gelatinosae, 1–8 μ latae; (2) subcylindricae, interdum ramosae, fibulatae, tunicis pigmentatis, 3–8 μ latae.

Solitarius vel dense caespitosus ad terram prope Quercos, Tomich, Inverness-shire, 5 Sept. 1957 (typus in Herb. Kew.). P. adiposa macroscopico similis, sed a sporis majoribus, odore, absentia cystidiorum ad faciem lamellarum differt. P. lucifera item absentia cystidiorum ad faciem lamellarum similis est, sed a sporis ellipsoideo-phaseoliformibus, odore nullo, cystidiis aciei lamellarum ad apicem ± acutis differt.

Cap 20–48 mm., convex soon expanded ± plane, sometimes obtusely umbonate or when old slightly depressed or with wavy-lobed margin, *sulphur-yellow soon turning rusty at centre*, sometimes with slight greenish yellow tinge at margin, finally almost entirely rusty or rusty-ochre, *viscid with separable pellicle*, often with *small ± concentric adpressed rusty fibrillose scales*, which are more crowded at centre and more widely spaced at margin, more rarely almost smooth, margin with remnants of pale yellowish veil. *Gills* adnate with tooth or slightly emarginate, sometimes subdecurrent, not or slightly ventricose, pale yellow then olive-yellowish finally olive-rusty, crowded, L 50–60 l 3–7, edge paler and minutely denticulate, *sometimes marked with dark rusty spots and weeping in wet weather*. *Stem* 25–60/3–10 mm., attenuated downwards or more rarely almost equal, pale yellow soon rusty or rusty-ochre from base, *yellowish veil forming sometimes fugacious ring-zone or distinct ring near apex*, below this fibrillose-striate with *± concentric zones of adpressed rusty or rusty-ochre fibrillose-floccose scales* like those on cap, stuffed then hollow, rather tough. *Flesh* sulphur or greenish yellow in cap and stem apex, *dark rusty or almost vandyke in lower part of stem* (often darkest in cortex). *Smell* faint to *rather strong*, *aromatic rather like incense*. *Spores ellipsoid-amygdaliform*, smooth, *9–11/4½–5½* μ (Fig. 353), dark rusty in mass. *Basidia* 4-spored, 32–36/7–8 μ. *Marginal cystidia* clavate or *clavate-capitate*, 18–40/7–14 μ at apex (Fig. 462). *Facial cystidia* and chrysocystidia *absent*. Cells of hyphae of cap cuticle: (1) 1–8 μ hyaline, gelatinous; (2) subcylindric, sometimes branched, clamped, 3–8 μ diam., walls pigmented.

Singly or densely caespitose on the ground near oaks, Tomich, 5 Sept. 1957 (type in Herb. Kew).

I prefer to describe this as a new species since none of the older descriptions of *Pholiota* spp. agree convincingly, neither does any modern description known to me; I suspect that further studies of the viscid-capped species of *Pholiota* and *Flammula* of older authors will reveal more species than are in our books (A. A. Pearson also held this view). Unfortunately some of them are seldom found so that it will take time before a good monographic study can be undertaken. Distinguished from *P. adiposa*, which it resembles macroscopically, by the larger spores, smell and lack of facial cystidia or chrysocystidia. *P. lucifera* also lacks facial or chrysocystidia but differs in absence of smell, ellipsoid-phaseoliform spores and marginal cystidia with a more acute apex. *P. muelleri* is another similarly coloured fungus but has much smaller spores and facial chrysocystidia. Judging by the description in A. A. Pearson's notebook in Herb. Kew under the name *P. pseudohypholoma* Vel., 1921, this agaric was collected by J. M. B. King in Surrey in 1952. Spores from a spore print taken by Pearson strongly support this (Fig. 353*b*). I prefer not to use Velenovsky's name without seeing type material, especially as he does not describe the gills as yellow but as 'primum pallidis, sed tum sature fuscis'.

PHOLIOTA CURVIPES (Fr.) Quél. and *P. TUBERCULOSA* (Schaeff. ex Fr.) Kummer

The chief characters given by Fries for separating these two species are those of the cap, given thus in the original diagnoses: *curvipes*, 'in squamas floccosas adpressas lacero' (*Epicrisis*, p. 168); *tuberculosa*, 'pileo adpresso-squamoso' and 'pileus squamis minutis adpressis' (*Syst. Mycol.* 1, 244), 'in squamulas innatas adpressas diffracto' (*Epicrisis*, p. 167). The habitats, too, are similar: *curvipes*, 'Ad ligna arb. frond. Populi, Rosae! etc. etiam Betulae' (*Epicrisis*, p. 168); *tuberculosa*, 'Ad truncos Sorbae, Betulae etc.' (*Syst. Mycol.* 1, 244).

I have several times gathered a small agaric on beech in the Box Hill area, Surrey, with the scales on the cap entirely rather minutely fibrillose, those round the centre being reflexed or pilose, which I believe to be *curvipes*, the emphasis being on the word 'lacero' in the original diagnosis as opposed to 'diffracto' for *tuberculosa*. I have also gathered another agaric in different parts of the country on birch and also oak with broader adpressed cap scales, i.e. 'diffracto', often more scattered towards the margin, which I believe to be *tuberculosa*. It varied more in size, the cap ranging from 12 to 65 mm., whereas the cap of *curvipes* is 10–27 mm. Both, however, were rather similar microscopically so far as I examined them. Their spores were ± phaseoliform, 7–9/4–5 μ, and the marginal cystidia cylindric-clavate or -capitate with rather long stalk, those of *curvipes* perhaps more frequently swollen below. In both, facial cystidia were absent. I have not collected *curvipes* recently and unfortunately have no data about the cap cuticle, which in *tuberculosa* is made up of clamped, hyaline, branched filamentous hyphae 6–18 μ diam., together with some encrusted pigmented ones 4–12 μ diam. In view of the macroscopic differences I prefer to keep these two apart, pending further field work, but it seems likely they may not really be different. *P. curvipes* as described by Romagnesi (*Bull. Soc. linn. Lyon*, **6** (1937), 139) is, however, *tuberculosa*.

P. curvipes	*P. tuberculosa*
Cap usually small, 10–27 mm., covered with rather dense minute fibrillose-pilose or reflexed scales	*Cap* sometimes more robust, 12–65 mm., covered, except sometimes at almost smooth centre, with rather broad adpressed scales, those near margin more widely spaced
Marginal cystidia cylindric-clavate often capitate and also swollen below, 25–50/4–8 μ, apex 5–10 μ	*Marginal cystidia* cylindric-clavate capitate with rather long stalk, 34–72/3–6 μ, apex (6)7–12 μ

PHOLIOTA MUELLERI (Fr.) P. D. Orton (see p. 180)

Though recently excellently described from France (see 'List'), no detailed description of this rather striking agaric exists in English, so I give one below. It is well illustrated in Saunders & Smith, *Mycological Illustrations*, 18^{1-2}, the plate being quoted by Fries for his var. *muelleri* in his later works.

Cap 30–100 mm., convex umbonate then expanded umbonate or ± plane, *lemon or chrome-yellow soon ochre-yellow, tawny or rusty at centre, viscid, with numerous rather thick fibrillose ochraceous or tawny-rusty scales*, those at centre pointed and ± pyramidal, those in the outer part recurved at tips, sometimes disappearing with age, margin with *copious yellowish or pale ochraceous appendiculate veil* when young. *Gills* adnate or adnato-decurrent, pale yellow then deeper chrome-yellow then dirty olivaceous or yellowish rusty, crowded, L 40–60 l 3–7(11), sometimes bruising reddish brown in places, edge concolorous or deeper yellow flocculose. *Stem* 30–150/5–20 mm., equal or ventricose, often pointed at base, pale to deep chrome- or sulphur-yellow above, rusty or sepia below, darkening when handled, *dry*, apex slightly yellow pruinose and sometimes striate from gills, yellowish or pale ochraceous, veil forming often fugacious ring-zone and a few patches below this, *lower part with pointed revolute darker rusty or sepia scales*, stuffed or hollow. *Flesh* pale yellow soon sulphur-yellow and tawny or rusty or finally sepia or bay in lower part of stem. *Taste* mild. *Smell* strong, like *P. squarrosa*. *Spores* ellipsoid-oblong or slightly phaseoliform, *5–7/3–4* μ, smooth, pale sub micr. *Basidia* 4-spored, 22–26/6–7 μ. *Marginal cystidia* cylindric, clavate or fusiform, sometimes flexuose below, 18–48/5–12 μ. *Facial cystidia*, clavate to lageniform with rather acute apex, 20–50/5–10 μ, some at least with contents turning deep yellow in NH_4OH (*chrysocystidia*).

Caespitose on stumps or on submerged wood (? always beech): Stoke Row, Oxon., 24 Oct. 1953; Manor House, Rothamsted, Herts, 8 Nov.

1953; Burnham Beeches, Bucks, 23 Oct. 1955. Differs from *P. adiposa* in dry stem and perhaps more robust habit. Readily recognized by viscid cap with dark rusty scales, dry stem, small spores and chrysocystidia.

PHOLIOTA OCHROCHLORA (Fr.) P. D. Orton (see p. 180)

Some authors have stated that *Flammula ochrochlora* is only a dry form of *F. gummosa* or have expressed doubts that they are distinct. I have, however, retained *ochrochlora* (transferred to *Pholiota*) in the 'List' as well as *P. gummosa*, since I collected an agaric in 1957 which I believe to be *Agaricus ochrochlorus* Fr. This not only differed from *P. gummosa* in the dry cap but also in lack of facial or chrysocystidia and a few other minor details. I need to do more field work before dealing in full with *P. gummosa*, which I suspect may be a mixture, since the Fries illustration in *Icones Selectae* under this name looks distinct from that which I know as *P. gummosa* and believe to be identical with the original *A. gummosus*. Here is a description of my collection of *P. ochrochlora*:

Cap 18–43 mm., convex, soon expanded or slightly depressed, *straw colour, sometimes with* slight ochraceous tinge at centre or *greenish tinge at margin, slightly viscid only when quite young, soon dry*, with *adpressed* or slightly reflexed *sometimes pointed or V-shaped fibrillose scales especially at centre*, scales straw-yellowish to olivaceous, margin with pale straw appendiculate veil at first. *Gills* adnate with tooth or subdecurrent, *pale straw-yellowish then pale olivaceous to olive-buff* or olive-ochre, subcrowded, L 50–54 l 1–3, edge paler, then concolorous, even or very minutely flocculose. *Stem* 25–35/4–7 mm., attenuated downwards, *whitish or pale straw at apex, deeper straw or slightly ochraceous below apex, reddish rusty or pinkish tawny at base*, apex sometimes floccose-fibrillose over base of gills, veil forming fugacious apical ring-zone, below this *reflexed ± pointed straw or slightly greenish fibrillose scales* often arranged in transverse bands, silky fibrillose beneath these scales, stuffed then narrowly hollow. *Flesh* straw or whitish yellow, deeper sulphur in centre of cap and stem, pinkish tawny to reddish rusty in stem base. *Smell* none. *Taste* mild. *Spores* ellipsoid or slightly ovoid, occasionally slightly phaseoliform, 6–8/4–5 μ, chocolate-rusty in mass. *Basidia* 4-spored, 26–30/5–6 μ. *Marginal cystidia* clavate-capitate or cylindric-flexuose, not or scarcely swollen below, 28–50/3–5 μ, apex 4–7 μ. *Facial cystidia absent* (except that one or two clavate-basidiiform cells projected slightly above hymenium), chrysocystidia absent. Hyphae of cap cuticle filamentous, clamped, branched, 3–8 μ diam., hyaline or yellowish sub micr. (daylight), those of scales 4–10 μ diam. apparently with brownish pigment in cell walls.

One small clump on log (? elm), Norbury Park, Mickleham, Surrey, 7 Oct. 1957.

Pleurotellus patelloides sp.nov. (Figs. 170–172, 356, 463)

Pileus 4–18 mm., conicus vel conchae Patellae similis, rariore convexus, interdum fere planus sed a gibbo affixus, albus dein senectute leviter cremeo-tinctus, primo totus albosericeo tomentosus dein circa punctum conjunctionis glabrescens, jove pluvio exstriatus, interdum radialiter rugulosus vel ad marginem senectute sericeo-rimosus vel concentrico depresso-zonatus, ad marginem primo eleganter sericeo-laceratus. Lamellae in puncto medio vel leviter excentrico concurrentes, albae, interdum senectute cremeae, subdistantes, vel subconfertae, L 8–18 l (0) 1–3(7), haud ventricosae, ad aciem integrae vel interdum conspicue albo-flocculosae. Stipes nullus, pileus ad ramulos puncto medio vel leviter laterale supero conjunctus. Caro tenuissima, alba. Odor nullus. Sporae late ellipsoideae, laeves sub immers., (7) 7½–10(11)/5–6½(7) μ (Fig. 356), non amyloideae, in cumulo albae. Basidia 2–4-sporigera, 32–36/7–8 μ. Cystidia aciei lamellarum nunc cylindrico-flexuosa vel fere clavata nunc lageniformia haud raro ad apicem 1–3 appendicibus simplicibus vel ramosis, interdum cornu cervi similis, 22–48/6–12 μ appendicibus 8–26/3–4 μ (Fig. 463). Hyphae cuticulae pilei hyalinae ramosae filamentosae intertextae, cellulis 4–6 μ latis interdum fibulatis, cellulis ultimis vulgo 250 μ longis et acutis.

Ad ramulos et stipulas herbaceas (praecipue Rubi), gregarius. Dowlands Landslip, Rousdon, Devon, 17 Dec. 1958 (typus in Herb. Kew.). Pleurotus chioneus sensu J. Lange non al. idem censeo.

Cap 4–18 mm., *conical or limpet-shell shaped*, less commonly convex, sometimes becoming ± plane but humped at point of attachment, which is usually central but sometimes lateral and on the upper side, *white, discolouring slightly creamy only when quite old, entirely white silky tomentose* then ± silky-smooth round point of attachment, *not* striate when moist, sometimes radially wrinkled or silky-rimose or concentrically depressed-zoned towards margin when old, *margin fringed delicately silky-lacerate at first. Gills* meeting at a central or slightly excentric point, *white*, sometimes becoming creamy when old and dry, not or fairly crowded, L 8–18 l (0) 1–3(7), not or hardly ventricose, edge even or sometimes conspicuously white-flocculose. *Stem* none. *Flesh* very thin, white. *Smell* and *taste* none. *Spores broadly ellipsoid*, smooth sub immers., *(7) 7½–10(11)/5–6½(7)* μ (Fig. 356), non-amyloid, pure white in mass. *Basidia 2- or 4-spored*, 32–36/7–8 μ. *Marginal cystidia* numerous, from cylindric-flexuose or ± clavate to lageniform, not uncommonly with 1–3 simple or branched appendages at apex (sometimes stag's-horn shape), 22–48/6–12 μ, appendages 8–26/3–4 μ (Fig. 463). Hyphae of cap cuticle hyaline, branched, interwoven, filamentous, cells 4–6 μ diam. sometimes clamped, end cells often long and pointed, 250 μ or more long.

Gregarious on twigs and herbaceous stems (especially bramble), often growing up to 4 ft. above ground level and festooning twigs or stems for more than 1 ft. in length. Dowlands and Bindon Landslips, Rousdon, Devon, 29 Nov. 1958 and 18 July 1959; Dowlands, Rousdon, 17 Dec. 1958 (type in Herb. Kew), Bindon and Whitlands Landslips, Rousdon, 17 Dec. 1958 (very abundant); also Moccas Park, Herefordshire, 15 Sept. 1951. I prefer to describe this as a new species, though I think it is *Pleurotus chioneus* s. J. Lange, because *Agaricus chioneus* Persoon, 1828, is rather doubtful and the epithet *chioneus* has been used by Favre for *Crepidotus herbarum* and by Pilát for *Clitopilus hobsonii* and by others without clear definition. The wider range of spore size in my collections than that given by J. Lange (7–8/5 μ) is no doubt due to the presence of some 2-spored basidia in my collections. In a spore print from a 4-spored specimen spores were 7½–9/5–6 μ and from a 2–4-spored specimen 8–10/5½–6½ μ, whilst there were a few still larger ones on the gills.

PLUTEUS

Having been fortunate enough to live for the last 12 years near extensive beech woods with plenty of fallen timber, I have been able to examine a large number of collections of Plutei, since in my experience they are particularly numerous and varied on beech, though ash, elm, alder and willow are always worth investigation. At first I tried to fit my finds into the 'classical' species in our books, but I soon found that far too many would not agree sufficiently well to permit of a reasonably sure identification. Routine examinations soon showed that facial cystidia are much more constant in shape for a particular species than the marginal, and therefore taxonomically much more important. This increases our problem since very many of the older descriptions do not give details of facial cystidia. Marginal cystidia are critical only in those species without facial cystidia, an outstanding case being *P. thomsonii* (= *P. cinereus*) in which they often have very characteristic long fine apical points. Another essential microscopic feature is the structure of the cap cuticle; though it is often possible to tell in the field whether the cuticle is filamentous or cellular, microscopic inspection may be necessary before distinction can be certain. Spore details are rarely of taxonomic value for British species, though there are a few with spores all distinctly ellipsoid (e.g. *P. petasatus*, and there may be others yet undiscovered); the majority have subglobose *or* broadly ellipsoid spores all within much the same size range. Singer's work (these *Trans.* **39** (1956), 145–232) did very little to help me identify my puzzles, perhaps because his key is based largely on North American and tropical material and does not include several of our more common species. I find, also, that I am obliged to contest some of his statements (see below in the notes on some species). I have still some unsolved puzzles in my notes and suspect that there are yet more of these rather fascinating agarics to be found and described in this country. Kühner & Romagnesi (*BSMF*, **72** (1956), 181–239) have given most useful descriptions of a number of species, some of them new. The accompanying key is based for the most part on my field notes but also includes all the species described by Kühner & Romagnesi (1953, 1956), which I hope may help towards easier identification of British collections. Essential microscopic information required includes details of facial cystidia and cap cuticle; spores are subglobose to broadly ellipsoid within the range of 5–8/4–7 μ unless otherwise stated.

Key to species of Pluteus

1. Cap cuticle filamentous (all cells subcylindric or elongate-fusiform except end cells which may be elongate-clavate and not necessarily repent, Figs. 464, 482) **2**

1. Cap cuticle cellular (cells spheropedunculate, pyriform or fusiform-vesiculose, Fig. 478) *or* mixed (some erect clavate-fusiform or lageniform cells projecting through the spheropedunculate or pyriform ones, Fig. 479) **33**

  2. Facial cystidia with hooked apex (mostly 3 or 4 points), sometimes rather thick walled (Figs. 446, 467, examples from *petasatus* and *salicinus*) **3**

  2. Facial cystidia absent or if present not hooked at tips, usually thin walled (Figs. 465, 468, 469, 471–477) **9**

Species with filamentous cuticle and hooked facial cystidia

3. Cap predominantly white or ivory, sometimes brownish or greyish at centre, not distinctly fibrillose-scaly but may be very finely silky-scaly in centre; spores mostly ellipsoid or ellipsoid-oblong **4**

3. Cap *either* entirely sepia, vandyke, umber, grey-brown, or greenish grey *or* with conspicuous dark brown fibrillose-scales at least at centre on a whitish or white background; spores subglobose or ellipsoid **5**

4. Cap 50–70 mm., shining white or ivory, sometimes discolouring slightly pale brownish in places when old; stem 40–60/6–10 mm., pure white, not or hardly discolouring; spores cylindric-ellipsoid or ovoid, 5–7½/4–5 μ; on beech logs or stumps *pellitus*

4. Cap 80–190 mm., whitish or greyish with darker greyish, sepia or umber centre; stem 85–200/10–25 mm., white then discoloured dirty brownish from base; spores ellipsoid-oblong, 6–10/4–6 μ; on sawdust or very rotten wood; cap slightly viscid when moist, cuticle separable, margin often thin fleshed and striate when moist (resembling *Volvariella speciosa* when seen from above) *petasatus*

5. Cap 19–62 mm., greenish or glaucous-grey often darker or blackish green at centre and paler at margin, sometimes striate when moist, hygrophanous, paler when dry; stem 25–70/2–6 mm. (< 8 mm. at base), sometimes tinged greenish or greenish grey at base *salicinus*

5. Cap and stem without greenish or glaucous colours; cap rarely striate, not hygrophanous **6**

6. Stem white or whitish, not brownish or blackish fibrillose-striate; cap at least at centre with distinct brownish or blackish brown fibrillose scales on a whitish background and outer part white or whitish (*cervinus* sometimes has a few scales at centre, but the outer part is coloured) **7**

6. Stem whitish, brownish or blackish, usually at least in part fibrillose-striate; cap from entirely umber, sepia or vandyke to paler at margin (which is rarely whitish), minutely silky shiny or innately fibrillose with fairly separable cuticle *or* with concolorous or paler fibrillose scales at centre **8**

7. Robust (cap 50–150 mm., stem 10–20 mm. diam.); stem entirely white fibrillose-scaly at first, sometimes brownish scaly at base, later adpressed silky-fibrillose; hyphae of cap scales of long narrow cells, *ca.* 130/3–7 μ *patricius*

7. More slender (cap 20–60 mm., stem 3–4 mm. diam., sometimes thicker at base); stem ± smooth
(*pseudoroberti* Moser 1953, nom.nud. = *P. roberti* s. Ricken non al.)

8. Gill edge distinctly dark brownish (marginal cystidia with brownish contents sub micr.); cap 60–150 mm., always dark (umber, vandyke or blackish brown), at first with pointed fibrillose scales, later adpressed pallid-buff scaly at least at centre; stem 6–16 mm. diam. blackish fibrillose-striate; on coniferous wood or sawdust *atromarginatus*

8. Gill edge concolorous, rarely slightly brownish when old; cap 30–120 mm., colour variable, from sepia with whitish margin to entirely umber or vandyke, smooth or slightly scaly at centre only; stem 5–15 mm., usually brown fibrillose striate at least below; on all kinds of wood and sawdust, very common; spores very variable, from subglobose to oblong-ellipsoid; (if cap predominantly grey and large, see *petasatus*, § 4) *cervinus**

Species with filamentous cuticle with facial cystidia when present not hooked

9. Cap and often also stem and young gill edge some shade of yellow; cap 20–80 mm., stem 3–10 mm. diam. **10**

9. Without yellow colours **11**

* A very large agaric with a very dark cap up to 250 mm. and stem up to 25 mm. diam. (40 at base) found on sawdust may be *cervinus* or another species.

10. Cap 40–60 mm., bright lion-yellow or lemon-golden-yellow, pruinose or velvety. cells of cuticle with yellow contents sub micr.; facial cystidia ± lageniform, 60–110/24–33 μ *leoninus*

10. Cap 20–80 mm., yellow beneath sepia or black-brown tomentum formed of long cylindric hairs with brownish contents sub micr., end cells fusiform-elongate, ± erect, 60–100/16–30 μ (*luteomarginatus* Rolland, RM, **8**, fasc. 3–4 (1943), 13)

11. Stem rose or lilac at base (inside and out), white or slightly pinkish above; (cap 35–60 mm., brown like *cervinus* or paler, minutely floccose-scaly to velvety-pubescent; cells of cap scales elongate-fusiform with narrower obtuse apex, 100–200/15–28 μ; facial cystidia ± fusiform with broad neck, *ca.* 66/20–27 μ) (*roseipes* Höhnel = *carneipes* Kühner, *Bull. Soc. linn. Lyon*, **19** (1950), 100)

11. Stem without characteristic pink or lilac tinge at base **12**

12. Gill edge entirely and conspicuously darker sepia or dark brownish flocculose; cap and stem entirely fibrillose-floccose or velvety scaly; cap 40–94 mm., margin conspicuously strigose-fringed at first; stem 50–90/4–11 μ; cells of scales on cap, *ca.* 150–300/10–24 μ slightly fusiform or elongate-clavate; facial cystidia ± lageniform often with fairly long narrow neck, 58–80/16–24 μ, apex *ca.* 8–14 μ, with brownish contents *umbrosus*

12. Gills not consistently or entirely dark-edged, sometimes slightly darker brownish near margin of cap in a few species when old; if cap and stem entirely dark brown scaly, fungus often smaller and cap without conspicuous fringe at first **13**

13. Stem entirely minutely fibrillose- or flocculose-scaly, scales dark brown or blackish grey, sometimes more scattered in old specimens; cap frequently similarly scaly **14**

13. Stem *either* without scales *or* with scattered brownish or blackish scales in lower part only *or* entirely white floccose-scaly **17**

14. Cap and scales on stem grey-sepia or blackish grey (colour of *Tricholoma terreum*); medium to fairly large, cap 40–70 mm., stem 3–9 mm. diam.; growing on the ground; scales often confined to lower part of stem *pearsonii* (see § 29)

14. Cap and scales on stem not grey-tinted but sepia, vandyke or umber (colour of *P. cervinus*); small to medium, cap 23–45 mm., stem 1½–6 mm. diam.; growing on wood or about stumps; scales covering whole stem except extreme apex **15**

15. Cap cuticle of (1) spheropedunculate or pyriform cells with brownish vacuolar contents, and (2) ± fusiform cells 70–150/12–26 μ with brownish vacuolar contents and also often a blackish brown pigment forming a dark body or granular mass (Figs. 479*a*, 480), sometimes also in penultimate narrow cells and in some of the hyphal cells of stem scales *podospileus*

15. Cap cuticle cells all of one kind, but sometimes ± erect in places; conspicuous blackish brown or granular pigment bodies absent **16**

16. On deciduous wood (especially beech); cells of scales on cap cylindric-fusiform becoming ± repent, end cells often elongate fusiform with long pointed tips, occasionally branched near base, 100–300+/10–20 μ (Fig. 482); spores 5–7/4–5½ μ; facial cystidia lageniform with short or long fairly broad neck, 70–100/(10)18–30 μ, apex *ca.* 8–14 μ, often with brownish vacuole (Fig. 483); cap 18–45 mm., stem 20–60/2–6 μ, sometimes abruptly bulbous (if large and robust, see *villosus*, § 30) *punctipes*

16. On coniferous wood; end cells of cap scales shorter, cylindric clavate or fusiform, 100–150/18–35 μ, forming a palisade at first; spores 6½–8½/6–7 μ; facial cystidia (sec Métrod) ± fusiform, sometimes slightly capitate or with a tendency to form hooks, *ca.* 80–90/15–30 μ; cap 20–60 mm., stem 3–5 mm. diam., ± equal or slightly thickened at base

(*plautus* (Weinm.) Gillet s. Konrad & Maubl., J. Lange, Métrod, RM, **8** (1943), 15, fig. 4: L 71 H)

17. Marginal cystidia ± clavate or pointed fusiform, 30–60/8–20 μ, some with long fine points < 50 μ long (Fig. 486); facial cystidia absent; cap cuticle mixed; cap 8–51 mm., sepia, vandyke or blackish brown drying greyish, often strongly veined at or round centre but sometimes entirely smooth, striate at margin when moist *thomsonii* (see § 48)

17. Marginal cystidia without long fine points (in *exiguus* often with short narrow appendix); facial cystidia usually present, if absent cap characters otherwise (smaller or ± scaly) **18**

18. Consistently small; cap 5–20 mm. rarely more, tomentose-scaly or conspicuously silky fibrillose to minutely scaly, not striate at margin except in *minutissimus*; facial cystidia absent except in *minutissimus* **19**

18. Larger; cap 20–110 mm., rarely less than 20 mm., smooth or scaly, striate or not; facial cystidia usually present **23**

19. Cap ± entirely covered with minute dirty brownish, sepia or dark brown scales (almost needing a lens to be seen) on white or whitish background **20**

19. Cap ± entirely conspicuously tomentose-scaly, silky-fibrillose or velvety-scaly, grey to dark brown **21**

20. Facial cystidia absent, marginal cystidia characteristic, clavate-fusiform with short broad appendix, *ca.* 30–50/12–18 μ, apex 3–4½ μ; cap 13–20 mm., densely minutely sepia or dark brown scaly, whitish or greyish background showing through especially near margin; stem white or whitish grey, minutely sparsely flocculose to ± smooth; spores ellipsoid 6½–8½/4½–6 μ; on the ground (*exiguus* Pat., BSMF, **72** (1956), 187, figs. 3, 4)

20. Facial cystidia ± lageniform, *ca.* 80/26 μ; marginal cystidia ± clavate without terminal appendage, 50–64/16–20 μ; cap 20–30 mm. (but may be smaller), white then tinged clay-brown at centre, minutely darker brownish squamulose under lens; spores subglobose 6–7½/5–6 μ; on wood *gracilis* (see § 31)

21. Cap entirely covered with grey or silvery-grey adpressed or slightly reflexed fibrils or fibrillose scales, margin often ciliate-fringed-strigose, sometimes with a few ± erect pointed fibrillose darker brownish scales; facial cystidia absent or inconspicuous; hyphae of cap scales ± repent, cells fusiform-cylindric, end cell often rather pointed at apex, 60–200/6–20 μ; stem whitish or pallid-greyish, ± smooth, but sometimes with scattered white flocci at base; marginal cystidia clavate to utriform, sometimes all clavate or some with short broad obtuse appendage; on wood *hispidulus*

21. Cap ± entirely sepia or dark-brown, minutely velvety-scaly, margin even; facial cystidia present or absent **22**

22. Facial cystidia present; cap cuticle mixed *minutissimus* (see § 51)

22. Facial cystidia absent; cap cuticle entirely of subfusiform elongate cells, 11–20 μ diam.; gill-edge becoming minutely brownish flocculose; cap 6–12 mm., minutely velvety scaly; stem whitish then brownish, ± smooth; marginal cystidia subfusiform to ± lageniform, 50–75/10–15 μ (*pusillulus* Romagn. = *minimus* s. Romagn., RM, **2** (1937), 133, fig. 4)

23. Cap soon pellucid-striate at margin at least when moist, sometimes drying sulcate, thin-fleshed at margin, sometimes very soft and almost deliquescent when old; centre of cap silky smooth or punctate- or granular-scaly **24**

23. Cap not striate when moist, *either* distinctly but sometimes minutely scaly *or* the velvety or minutely pilose-scaly cuticle disrupting in places and showing the white flesh (sometimes radially so and making the cap appear striate) **28**

24. Cap 25–70 mm., with scattered dark brown granular scales most closely arranged at centre and paler striate smooth margin; cells of hyphae of cap scales subfusiform or subcylindric, *ca.* 100–200/15–25 μ; stem 25–45/3–5 mm., pure white and white floccose then discoloured brownish or dirty yellowish from base and striate (*granulatus* Bres.—Bres 540: BSMF, **72** (1956), 218, fig. 21)

24. Scales of cap (if present) and general cap colour paler or dirty olive or greyish **25**

25. Cap cuticle mixed, some ± lageniform or fusiform cells, *ca.* 14–16 μ diam. projecting between spheropedunculate or pyriform cells up to 46 μ diam.; cap 16–35 mm., pale grey to olive-grey or olive-sepia and often darker sepia at centre; stem ± equal, rather slender (2–3 mm. diam.), white silky striate *godeyi* s. J. Lange (see § 42)

25. Cap cuticle entirely of cylindric, elongate clavate or subfusiform cells; if cap grey or olive, stem usually bulbous at base and more robust, 2–7 mm. diam., 5–10 mm. at base **26**

26. Cells of hyphae on cap repent, subcylindric or slightly pointed fusiform at apex, 9–16½(25) μ diam.; flesh of stem white; smell none; (cap 27–36 mm., dirty brownish with paler whitish margin, silky shiny but slightly minutely velvety scaly at centre, almost deliquescent when mature like the gills; facial cystidia lageniform with rather broad apex, 38–85/13–25 μ, with 1–3 brownish vacuoles; on poplar; sec Romagnesi) (*hiatulus* Romagnesi, BSMF, **72** (1956), 215, fig. 20)

26. Cells of hyphae on cap repent *or* palisade-like then sometimes repent, elongate clavate, subfusiform or strangled below apex, 12–32(44) μ diam. (as in Fig. 464); flesh of stem discolouring with age; smell often becoming strong pungent, like *Scleroderma*, or spirituous; cap frequently pinkish when old **27**

27. Cap 15–62 mm., hygrophanous, horn colour or olive brownish, sometimes whitish at first, drying white or whitish, usually minutely scaly (pale sepia or olive-brownish) at least at centre; flesh of cap sepia or olive-brownish, drying whitish, usually sharply marked off from white then discoloured dirty brownish flesh of stem; facial cystidia ± lageniform, 60–100/12–38 μ, frequently with pale brownish vacuole(s) (Fig. 465); stem usually conspicuously and abruptly bulbous at base *boudieri*

27. Cap 18–50 mm., pale brownish or pallid ochraceous then whitish or tinged colour of stem when old, minutely velvety then ± smooth; flesh white, discolouring brownish or yellowish ochraceous in lower stem; facial cystidia ± lageniform, 50–82/14–23(33) μ without coloured contents; stem ± thickened or slightly bulbous at base, often discolouring yellowish or ochraceous below (*depauperatus* Romagn., BSMF, **72** (1956), 221, figs. 22, 23)

28. Cap cuticle at first velvety or minutely pilose-scaly and almost unicolorous, later may disrupt in places showing white flesh (conspicuously so in *murinus*, Fig. 184); medium to fairly large, cap (30)40–110 mm., stem 3–17 mm. diam. **29**

28. Cap *either* at least in part with conspicuous ± concentric dark brown scales on a white background *or* appearing whitish tinged clay-brown at centre, but under lens minutely dirty brownish scaly on a paler background; small to medium, cap 20–60 mm., stem 3–6 mm. diam. **31**

29. Cap 40–70 mm., predominantly soot-black or blackish grey, sometimes with slight sepia tinge about centre, cuticle sometimes cracking in places but not so strikingly as in *murinus*; on the ground *pearsonii*

29. Cap 30–110 mm., predominantly sepia, vandyke or umber (colour of *P. cervinus*) never grey or black, cuticle cracking or not; on the ground or on wood **30**

30. Cap 30–70 mm., cuticle velvety or tomentose-flocculose at first then disrupting markedly giving a rimose or falsely striate appearance at margin (Fig. 184); stem 35–65/3–9 mm., white or discolouring slightly brownish, without brownish scales at base; on the ground; facial cystidia elongate clavate or broadly lageniform with short squat neck, *ca.* 60–70/20–22 μ; cells of cap cuticle hyphae subfusiform or subcylindric, (50)80–140/10–14(18) μ *murinus*

30. More robust; cap 80–110 mm., minutely velvety scaly, cuticle hardly cracking, but margin may become radially split ('d'un joli gris-brun assez doux' sec Romagnesi, but BSMF, **43** (1927), Pl. 19, is colour of *P. cervinus*); stem 90–130/10–17 mm., white or slightly discoloured, with minute brownish scales on lower part; on deciduous wood; facial cystidia

fusiform to lageniform, 65–80/17–30 μ; cells of hyphae of cap cuticle elongate fusiform, *ca.* 13–20 μ diam. (*villosus* s. Decary, Romagn., BSMF, **72** (1956), 212, fig. 18; **43** (1927), Atlas Pl. 19)

31. Cap 20–40 mm., white then tinged clay-brown at centre, under lens entirely dirty brownish scaly; stem 30–40/3–4 mm. (up to 6 mm. at base), sometimes bulbous, entirely minutely white pruinose at first; on deciduous wood; cells of hyphae of cap scales subfusiform or subcylindric up to 120/12–18 μ; facial cystidia ± lageniform, up to 80/26 μ *gracilis*

31. Cap 25–60 mm. with conspicuous dark brown or blackish scales on white or whitish background at or round centre; stem smooth or fibrillose-striate 32

32. Cap 50–60 mm. with rather small dark brown ± concentric scales on white background except at smooth brown centre, thus looking like a Lepiota; on the ground; stem 40–60/4–5 mm., white turning grey, striate-fibrillose with bulbous acuminate base when growing in sand; cells of hyphae of cap cuticle 5–10 μ diam. *lepiotoides*

32. Cap 25–*ca.* 50 mm., white or whitish with conspicuous squarrose blackish scales at and round white or pale centre, margin smooth; on wood; cells of hyphae of cap scales elongate cylindric or fusiform, 67–234/10–18 μ; facial cystidia lageniform, 66–91/12–27 μ, apex 2–16 μ* *robertii* (non s. Ricken, J. Lange)

Species with cellular or mixed cap cuticle

33. Cap or stem in some part bright greenish, lemon or chrome-yellow, orange or scarlet (colours sometimes also in young gills) 34

33. Dull (some shade of grey, olive or brown) *or* white (stem tinged bluish or bluish greenish in *cyanopus* and sometimes discolouring dirty yellowish in *phlebophorus* and *pallescens*) 39

34. Cap 20–60 mm., scarlet then with orange or chrome margin; stem 18–50/4–10 mm., white soon tinged yellow or orange at or from base up, soon fibrillose-striate; facial cystidia mostly vesiculose-fusiform but some ± lageniform, 50–80/14–28 μ, apex 7–8 μ when lageniform; on deciduous wood, especially elm *aurantiorugosus*

34. Cap without scarlet, stem never orange 35

35. Flesh yellowish in cap, white in stem; stem 35–60/2–5 mm., white then whitish or creamy; cap 20–40 mm., mustard-yellow or brownish ochre, drying deep honey-yellow with slight greenish tinge, rugulose or finely veined at centre; gills white then pink, not tinged yellow; facial cystidia lageniform with long neck, 35–80/14–22 μ, apex 5–10 μ (Fig. 500); cells of cap cuticle 12–30 μ diam. with yellowish or brownish contents *luteovirens*

35. Not combining mustard-yellow or greenish cap and white stem and gills 36

36. At first sight resembling *Galerina unicolor* (= *marginata*); gills pale chrome or yellow-ochre then pinkish ochraceous or pinkish yellow-brown (almost colour of gills of *Lactarius pyrogalus*); cap 20–40 mm., chrome-yellow at margin gradually shading to tawny-yellow-brown or almost vandyke at centre, striate at margin when moist, sometimes finely veined at centre; facial cystidia ± lageniform or fusiform, 60–98/16–28 μ, contents sometimes yellowish (Fig. 468); stem 25–50/3–5 mm., pale dirty yellowish or pallid ochraceous; on beech log *galeroides*

36. Gills white or chrome at first not usually becoming ochraceous; cap *either* bicoloured (bright chrome and sepia or vandyke) *or* entirely sepia or vandyke with yellow background, sometimes gradually shading to yellowish at the margin; stem and flesh of stem sometimes deeper yellow 37

37. Cap distinctly and abruptly bicoloured, the usually bright chrome-yellow part sharply marked off from the sepia or vandyke remainder, margin not striate when moist (these *Trans.* **32** (1935), Pl. 37); gills chrome-yellow at

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* From specimen collected by D. A. Reid, on beech trunk, Burnham Beeches, Bucks, 20 Sept. 1958.

first; facial cystidia vesiculose or vesiculose-fusiform, 75–100/20–40 μ; cap 25–60 mm., finely veined at least in part; stem 25–60/2–10 mm., chrome or lemon-yellow paler at apex *splendidus*

37. Cap *either* entirely sepia or date-brown *or* sepia or vandyke on yellow background, sometimes gradually shading to brighter yellow at margin, striate or not when moist; gills white or pale chrome at first **38**

38. Facial cystidia mostly vesiculose-fusiform or broadly clavate, sometimes slightly lageniform with broad apex, 56–100/16–40 μ, apex 14–24 μ when lageniform (Fig. 471); cap margin not or scarcely striate, veined or not or rugulose round centre; stem 14–70/1½–6 mm., markedly chrome-yellow at least at base both inside and out; cap 12–50 mm. always sepia or vandyke at centre, sometimes yellowish at margin; gills chrome at first; common *lutescens*

38. Facial cystidia mostly lageniform with relatively narrower and longer neck, sometimes fusiform-lageniform, 40–84/14–30 μ, apex 4–12(14) μ, contents sometimes yellowish (Fig. 474); cap margin striate when moist, entirely rugulose, or veined at centre only; stem 25–60/2–8 mm. white or whitish then sometimes tinged lemon-yellow at base; cap 16–48 mm., date-brown, sepia-yellowish or sepia gradually shading at margin to brighter lemon-yellow, sometimes olive-brownish or lemon-olive round centre, when old entirely yellowish brown but margin usually persistently brighter; gills white or tinged chrome at first; cap cuticle with cylindric branched cells with bright yellow pigment below pyriform ones with brownish pigment (when cap appears brown) or hyaline (when cap appears yellow); distribution of pigment not yet fully investigated in *lutescens* *xanthophaeus*

39. Cap and stem white, barely discolouring; cap 15–30 mm., radially wrinkled-rugulose and mealy-atomate; stem 20–30/3–5 mm., white pruinose, base ± abruptly and conspicuously strigose-bulbous; facial cystidia lageniform or cylindric slightly fusiform at base, 60–115/13–30 μ *semibulbosus*

39. At least cap grey, olive-grey or some shade of brown **40**

40. Moist cap predominantly grey, olive-grey, greenish grey or olive-brown, sometimes darker sepia at centre only **41**

40. Moist cap predominantly umber, date-brown, sepia or vandyke, sometimes drying paler or greyish especially at the margin **44**

41. Facial cystidia absent; marginal cystidia ± clavate or pointed-fusiform, 30–60/8–20 μ, some with long fine points up to 50 μ long (Fig. 486); cap 8–51 mm., frequently veined or reticulate-veined especially round centre, but sometimes, especially in smaller specimens, smooth (Figs. 180, 181); cap cuticle mixed; stem grey, white floccose at first then white silky striate *thomsonii* (see § 48)

41. Facial cystidia present; marginal cystidia various but never with long fine points; cap smooth or rugulose, rarely veined, cuticle strictly cellular or mixed; stem white silky striate or smooth **42**

42. Cap cuticle apparently mixed, ± lageniform cells *ca.* 12–16 μ diam. amongst ± spheropedunculate or pyriform cells 14–46 μ diam. (Fig. 470); facial cystidia lageniform or more rarely fusiform, rather short, 56–64/16–22 μ, apex *ca.* 8–12 μ (Fig. 469); stem 25–45/2–3 mm., white or slightly silvery grey, base and sometimes apex greenish grey when moist; cap 16–35 mm., pale grey to olive-grey, olive-sepia or darker sepia at centre, striate *godeyi* (s. J. Lange)

42. Cap cuticle strictly cellular, all cells (sometimes with one or two rare exceptions) pyriform or spheropedunculate (Fig. 478); facial cystidia lageniform but longer with longer neck, (60)70–105/20–36 μ, apex 8–18 μ (Fig. 477); stem white *or* tinged olive-brownish below; cap *either* glaucous- or pallid-grey and not or barely striate when moist *or* olive-sepia and striate, drying paler **43**

43. Cap 30–50 mm., pallid-grey or glaucous-grey sometimes darker at centre, not or barely striate or hygrophanous when moist; stem white, 30–80/2–6 mm.; singly or in small tufts in beech leaves or on stumps (? always beech) *cinereofuscus*

43. Cap 12–30 mm. (but may grow larger), dark olive-sepia then with paler margin, striate when moist, drying grey-horn with olive-brownish centre; stem often tinged olivaceous or olive-grey below, 50–88/2–4 mm. (4–8 mm. at base); singly on ash twigs and probably other wood *olivaceus*

44. Spores distinctly and constantly ellipsoid; cap medium to large (35–90 mm.), not veined or reticulate; facial cystidia absent or very rare; marginal cystidia ± clavate or clavate-fusiform **45**

44. Spores subglobose, broadly ovoid or ellipsoid; facial cystidia present except in *thomsonii*, which has characteristic marginal cystidia (see § 48) **46**

45. Cells of cap cuticle not spheropedunculate but fusiform-vesiculose or cylindric-clavate, 30–49/21–29 μ; cap 35–60 mm., dark brown, pruinose matt at centre, remainder soon radially cracked showing white flesh, sometimes also finely concentrically cracked; spores 6½–9/5–5·7 μ; stem 30–45/5–7½ mm., white or slightly brownish at base, ± smooth
(*rimulosus* Kühn. & Romagn., BSMF, **72** (1956), 195, fig. 9)

45. Cells of cap cuticle spheropedunculate, 15–60 μ diam.; cap 35–90 mm., dark sepia then paler (umber-greyish), rugulose or slightly minutely veined, not cracked or only slightly so near margin; spores 8–10/5½–6 μ; stem 30–65/3–8 mm. (5–11 mm. at base), white or whitish and minutely striate or ± smooth above, discoloured greyish or brownish, and brownish floccose-scaly in lower part
(*poliocnemis* Kühner, BSMF, **72** (1956), 197, fig. 10)

46. Stem bluish or greenish blue, inside and out, at least in part (especially at base), 23–28/2–3 mm.; cap 17–23 mm., sepia; cells of cap cuticle shortly clavate, about 40 μ diam.; marginal and facial cystidia ± fusiform, 65–85/15–25 μ; on ground
(*cyanopus* (Quél) Métrod, RM, **8**, fasc. 3–4 (1943), 17, fig. 6)

46. Stem not blue or greenish blue **47**

47. Stem distinctly and ± entirely grey or slightly olive-grey, sometimes tinged sepia below, entirely white floccose at first, later white-silky striate; flesh sepia in cap cuticle, whitish or white in centre of cap and sometimes also in stem, grey or horny-grey in stem cortex (cap striate at margin when moist) **48**

47. Stem white or whitish sometimes discolouring pale dirty brownish or pallid-yellowish at base, *either* white silky-striate *or* in part or ± entirely sepia or blackish punctate-scaly; colour of cap flesh various, in stem white or whitish or discoloured like stem surface **49**

48. Facial cystidia absent; marginal cystidia ± clavate or pointed fusiform, 30–60/8–20 μ, some with long fine points < 50 μ long (Fig. 486); cap cuticle mixed, fusiform or ± lageniform cells 60–80/10–22 μ, some of which may have a long fine point, projecting through spheropedunculate or pyriform cells, 10–40 μ diam.; cap 8–51 mm., often strongly veined or reticulate-veined at or round centre, but sometimes smooth, hygrophanous, umber or sepia, sometimes blackish or with slight violaceous tinge when young, drying pale greyish or with slight olive tinge; common, on wood or, less commonly apparently, on the ground *thomsonii*

48. Facial cystidia present, vesiculose-fusiform slightly broadly lageniform, (45)50–90/16–32 μ, apex when lageniform *ca.* 10–20 μ diam.; marginal cystidia various but never with fine points; cap cuticle strictly cellular; cap 14–42 mm., pruinose-rugulose at first, sometimes veined at or round centre, vandyke or umber, sometimes paler at margin, not or slightly hygrophanous; on ground or on wood *griseopus*

49. Gill edge distinctly darker than rest, brownish (except sometimes near stem); cap 15–30 mm., date-brown or sepia drying paler, margin striate or not when moist, pruinose-atomate then finely veined or rugulose at centre; facial cystidia ± lageniform, 70–85/17–24 μ, sometimes with brownish contents; marginal cystidia variously shaped with brownish contents; stem *ca.* 40–50/3–4 μ, white or slightly brownish; smell slightly acid unpleasant like *phlebophorus* *luctuosus*

49. Gill edge not brownish or darker than rest **50**

50. Stem entirely (as in Fig. 178), or in lower part only, minutely dark brown or blackish punctate-scaly; cap cuticle mixed; facial cystidia ± clavate, cylindric- or fusiform-vesiculose with broad obtuse apex (Fig. 481) **51**

50. Stem not brown punctate-scaly, white silky-striate to ± smooth or brownish fibrillose-striate; cap cuticle strictly cellular or mixed; facial cystidia *either* clavate or fusiform-vesiculose *or* more narrowly lageniform **52**

51. Stem 24–40/1–3 mm., ± entirely and conspicuously but minutely dark brown or blackish punctate-scaly (Fig. 178); cap cuticle of ± fusiform cells 70–150/12–26 μ with narrow obtuse apex, with brownish vacuolar pigment and often also a dark-brown or blackish pigment forming a dark body or granular mass, often in stalk but also sometimes at apex, projecting through pyriform or spheropedunculate cells 12–54 μ diam. (Fig. 479*a*); penultimate narrow cells may also have dark pigment; cap 12–30(40) mm., entirely black-brown velvety scaly, sometimes tinged violaceous at centre when fresh, sometimes pellucid-striate at margin, but scales sometimes radially denser giving a false striate appearance; facial cystidia 30–64/12–24 μ (Fig. 481) *podospileus*

51. Stem darker brown punctate-scaly in lower part only or not at all; cap cells without black-brown granular pigment as well as brownish vacuolar pigment **52**

52. Cap cuticle mixed, of ± fusiform elongate cells (up to 182/20 μ) projecting through ± spheropedunculate cells 15–34 μ diam.; cap 7–25 mm., velvety punctate-scaly, striate at margin when moist; stem 9–21/1–1½ mm., white or slightly greyish, lower part with or without darker brown punctate scales; (facial cystidia clavate or cylindric vesiculose, 17–28 μ diam. sec Kühner) *minutissimus*

52. Cap cuticle strictly cellular, all cells pyriform or spheropedunculate; cap and stem never velvety punctate-scaly **53**

53. Facial cystidia clavate or vesiculose-fusiform, sometimes slightly narrowed at apex, 44–80/18–40 μ (Fig. 473); cap hygrophanous, striate at least at margin when moist, date-brown, umber or vandyke, drying pale grey-brown or sepia-horn and often darker at centre, often finely veined or rugulose at centre; cap 20–25 mm.; stem 35–55/2–4 mm. (probably grows larger) *pallescens*

53. Facial cystidia mostly lageniform with shorter or longer narrower neck and obtuse apex, 68–104/18–30 μ, apex 6–18 μ diam. (Figs. 475, 476), a few ventricose-fusiform occasionally present; cap not or scarcely hygrophanous, not striate or striate at margin only when moist, umber or vandyke to yellowish sepia **54**

54. Cap ± entirely veined, sometimes strongly and coarsely so, not striate when moist, umber or vandyke to yellowish sepia, usually of medium size, 27–60 mm.; stem relatively robust, (25)30–90/(1½)3–6 mm., rather tough and firm but sometimes with brittle cortex when fresh, becoming hollow, white, discolouring dirty yellowish or brownish from base up; smell soon unpleasant acidulous; facial cystidia 60–140/14–30 μ, apex *ca.* 7–15 μ (Fig. 476); on logs or about stumps *phlebophorus*

54. Cap rugulose or with pruinate bloom, rarely slightly veined at centre only, sometimes striate at margin when moist, rather persistently dark vandyke or chocolate-umber or almost black, sometimes very small, 7–47 mm.; stem more slender, 35–50/1–2 mm., soon soft and fragile (easily squashed), solid, silvery white when fresh but discolouring dirty brownish when old; smell none; facial cystidia 68–104/12–30 μ, apex 6–18 μ, lageniform or fusiform-lageniform (Fig. 475); most commonly on the ground, sometimes on wood *nanus*

PLUTEUS AURANTIORUGOSUS (Trog) Sacc.

As correctly stated by Singer (1956) this is the valid name for the bright-coloured agaric previously known in this country as *P. coccineus* (Massee) J. Lange or *P. caloceps* Atk.

Pluteus boudieri sp.nov. (Figs. 173–175, 464, 465)

Pileus 20–62 mm., e convexo expansus, interdum leviter umbonatus, albido-argillaceus vel colore cornus tinctus vel olivaceo-brunneus, interdum primo fere totus albidus, hygrophanus, siccitate albidus vel pallide griseus, ad marginem persistentiore albidus senectute vulgo rosaceo- vel incarnato-tinctus, interdum ad discum minute tomentoso- vel granuloso-squamulosus, jove pluvio ad partem externam forte pellucido-striatus vel sulcatus, siccitate opacus vel praecipue ad marginem leviter sericeo-nitidus. Lamellae liberae, ex albo incarnato-albidae dein incarnatae interdum leviter brunneolo-tinctae, confertae. Stipes 25–55/2–7 mm. (ad basim 4–10 mm.), aequalis vel sursum leviter incrassatus, vulgo ad basim abrupte vel submarginato rariore leviter bulbosus, albus dein sordide brunneolus vel colore pilei tinctus, primo totus albo-floccosus dein albo-sericeo striatus, senectute forte striatus, ad basim haud raro squamulis paucis olivaceo-brunneis obtectus, bulbo albo- vel albido-tomentosus vel strigosus, solidus, primo aliquantum firmus. Caro pilei hygrophana, colore cornus tincta vel olivaceo-brunneola siccitate albida, caro stipitis ex albo mox albida vel sordide brunneola, vulgo a carne pilei manifeste delineata. Odor debilis vel aliquantum fortis, gratus, vulgo vineus vel odori Sclerodermae similis. Sporae subglobosae, 6–8/5–7 μ. Basidia 4-sporigera. Cystidia aciei lamellarum clavata vel vesiculoso-fusiformia interdum prope apicem strangulata, 38–100/12–44 μ. Cystidia faciei lamellarum fusiformia vel late lageniformia, vulgo 1–3 brunneo-vacuolata, 60–90/(12) 16–38 μ (Fig. 465). Cellulae ultimae cuticulae pilei cylindricae, cylindrico-fusiformes vel elongato-clavatae vulgo prope apicem strangulatae, 60–180/(11) 15–30(38) μ (Fig. 464*b*).

Ad ligna putrida diversa decidua (Fagi, Ulmi, Sambuci, etc.), vulgatus. Juniper Hill, Mickleham, Surrey, 1 Oct. 1955 (typus in Herb. Kew.). Cellulis ultimis cuticulae pilei vulgo strangulatis, cystidiis faciei lamellarum magnis vulgo brunneovacuolatis, odore, carne stipitis a carne pilei manifeste delineata stipite bulboso insignis. P. semibulbosus sensu Boudier, Kühner & Romagnesi (non Fries, J. Lange) idem est.

Cap 20–62 mm., convex, soon expanded, sometimes slightly umbonate, whitish clay to pale horn or with olive tinge or olive-brown at centre, *margin ± persistently white or whitish often becoming rosy or pinkish in larger specimens*, sometimes entirely whitish at first, *hygrophanous*, drying whitish or pale greyish, sometimes minutely tomentose-squamulose or granular-scaly at centre, when moist *pellucid-striate or sulcate in outer half*, drying matt or with slight silky sheen especially at the margin. *Gills* free, white then pinkish sometimes with slight brown tinge, crowded. *Stem* 25–55/2–7 mm. (4–10 mm. at base), equal or slightly thickened upwards, often with abruptly or submarginate bulbous base, more rarely only slightly so, white then discoloured dirty brownish or colour of cap, *entirely white floccose at first then white silky striate*, markedly so when old, base sometimes with a few olive-brownish scales as on cap, bulb white- or whitish-tomentose or strigose, solid, rather firm at first. *Flesh hygrophanous in cap*, horny or olive-brown, drying whitish, in stem white, soon whitish or dirty brownish, *sharply marked off from that of cap at stem apex. Smell faint to fairly strong, pleasant, winey* or like *Scleroderma. Spores* subglobose, 6–8/5–7 μ. *Basidia* 4-spored. *Marginal cystidia* clavate or vesiculose-fusiform, sometimes slightly constricted near apex, 38–100/12–44 μ. *Facial cystidia fusiform to* *broadly lageniform*, often with 1–3 brownish vacuoles (Fig. 465*a*), 60–90/(12)16–38 μ. End cells of hyphae of filamentous cap cuticle *cylindric or cylindric-fusiform to elongate-clavate often slightly constricted near apex*, 60–180/(11)15–30(38) μ (Fig. 464*b*).

On fallen wood of various deciduous trees, especially beech, also elm, elder, etc., common: Juniper Hill, Mickleham, 26 Sept. 1953 and 1 Oct. 1955 on beech (type in Herb. Kew); Clapham Wood, Yorks, 21 Sept. 1957 (on elder); The Pit, Surlingham, Norfolk, 21 Sept. 1957; Mountain Wood, East Horsley, Surrey, 25 June 1958.

Best distinguished by often strangulated end-cells of cap cuticle, smell, flesh of cap sharply marked off from that of stem, large facial cystidia usually with brownish vacuoles, hygrophanous strongly striate cap and bulbous stem. This is *P. semibulbosus* s. Boudier, Kühn. & Romagn., but I have described it as new since Fries originally described *Agaricus* (Pluteus) *semibulbosus* (*Epicrisis*, p. 141) with cap 'atomato-molli' including it in the same section as *A.* (P.) *nanus*, which infers a cap with cellular cuticle. I therefore prefer J. Lange's interpretation for *P. semibulbosus* which has a cellular cuticle. Boudier's plate is a very good representation of larger specimens, smaller ones are sometimes much paler or almost white and it takes time to recognize this widespread species in all its colours. As with some other *Pluteus* spp. with initially flocculose-pruinose stem, this disappears with age leaving it silky- or fibrillose-striate; this, too, I have only learnt after considerable field experience.

PLUTEUS CURTISII (Berk. & Br.) Sacc.

Singer (1956), on the ground that a drawing on the type sheet of *P. curtisii* represents *P. patricius* (which it very likely does), used the name *P. curtisii* for the agaric known in Europe as *P. patricius*. This drawing, however, does not refer to the type specimen (no. 1523 on the sheet) but is a copy of one on the type sheet referring to a later gathering (no. 5052) sent by Spode from New England to Curtis. The original drawing of this later collection on the type sheet is not coloured but Cooke's copy (the one selected by Singer) is tinted by Cooke himself in accordance with the description in Spode's notes on the back of the drawing of no. 5052. Nor does this later drawing agree macroscopically with the original description. Curtis's own notes on the type (no. 1523) state the cap to be 'liver-brown', as in the original diagnosis of Berkeley & Curtis, 'dark liver-brown, smooth, not wrinkled, viscid when moist, with a satiny lustre when dry'. This very strongly suggests *P. cervinus*, which is further confirmed by the presence of hooked facial cystidia in the type specimen (no. 1523). Since the cap of *P. patricius* is described in the original diagnosis as 'albidus sed mox fumoso-griseus, in disco praesertim squamis umbrinis et cinnamomeis ornatus', this is clearly not *P. cervinus*, nor does it agree with the original diagnosis of *P. curtisii*. *P. patricius*, therefore, should be maintained for the European agaric known as such, whilst *P. curtisii* (type) must be regarded as a synonym of *P. cervinus*.

PLUTEUS CINEREOFUSCUS J. Lange

This name is retained as such in the 'List' and not treated as a synonym of *P. thomsonii* as suggested by Singer (l.c. p. 216); for discussion see notes on *P. thomsonii* (p. 365).

Pluteus galeroides sp.nov. (Fig. 468)

Pileus 20–40 mm., e convexo expansus, ad marginem clare flavus discum versus gradatim magis brunneotinctus ad discum fulvo-luteolo-brunneus vel fere umbrinus, jove pluvio ad marginem striatus, ad discum pruinosus leviter rugulosus vel eleganter venosus, ad marginem glaber. Lamellae liberae, ± remotae, ventricosae, pallide flavae vel flavo-ochraceae dein ochraceo-incarnatae vel incarnato-luteolo-brunneae (interdum colori lamellarum Lactarii pyrogali similes), subconfertae, L ca. 40–48 l 0–3. Stipes 25–50/3–5 mm., aequalis vel ad basim vel ad apicem leviter incrassatus, cremeo- vel sordide-flavus vel sordide-ochraceus, interdum ad basim obscuriore coloratus, juventute albosericeo striatus, solidus. Caro pallide flava vel sordide brunneola, in pileo vulgo clariore flavo-tincta, interdum in stipite albida. Odor debilis vel aliquantum fortis, ingratus, acidulosus (odori P. phlebophori similis). Sporae subglobosae vel late ovoideae, 5–8/5–6 μ. Basidia 4-sporigera. Cystidia aciei lamellarum fusiformia vel lageniformia 60–90/12–24 μ ad apicem ca. 6–8 μ lata. Cystidia faciei lamellarum lageniformia rariore fusiformia 60–100/16–28 μ ad apicem 6–11 μ lata, vulgo flavo- vel senectute brunneolo-vacuolata (Fig. 468). Cellulae cuticulae cellularis pilei spheropedunculatae vel pyriformes, 16–30 μ latae, flavo- vel brunneolo-vacuolatae.

Ad lignum Fagi, Mountain Wood, East Horsley, Surrey, 11 Oct. 1953 (typus in Herb. Kew.). A coloribus Galerinae unicolori similis. P. lutescens a coloribus minus flavotinctis (exceptu stipitis) cystidiis faciei lamellarum ad apicem latioribus, P. xanthophaeus a coloribus molto minus flavotinctis, P. splendidus coloribus pilei distincte bicoloratis, pileo jove pluvio exstriato, cystidiis faciei lamellarum ad apicem latioribus differunt. A colore pileo P. luteovirens affinis sed a stipite albo lamellis non flavotinctis et pileo magis citrino vel viride-flavo distinguitur.

Cap 20–40 mm., convex then expanded, *chrome-yellow at margin gradually shading to tawny-yellow-brown or almost vandyke at centre*, *striate at margin* when moist, pruinose or slightly rugulose or finely veined at centre, smooth at margin. *Gills* free, ± remote, ventricose, *pale chrome or yellow-ochre then pinkish ochraceous to pinkish yellowish brown* (sometimes coloured like the gills of *Lactarius pyrogalus*), subcrowded, L *ca.* 40–48 l 0–3. *Stem* 25–50/3–5 mm., equal or slightly thickened at base or apex, *creamy- or pallid-yellowish or pallid-ochraceous*, sometimes darker at base, white silky-striate when fresh, solid. *Flesh* pale yellowish or dirty brownish, *usually tinged chrome in cap*, sometimes whitish in stem. *Smell* faint to rather strong, unpleasant, acidulous (like the smell of *P. phlebophorus*). *Spores* subglobose or broadly ovoid, 5–8/5–6 μ. *Basidia* 4-spored. *Marginal cystidia* fusiform or lageniform, 60–90/12–24 μ, apex *ca.* 6–8 μ. *Facial cystidia lageniform or less commonly fusiform*, 60–100/16–28 μ, *apex 6–11 μ*, *with yellowish or, when old, brownish vacuolar contents* (Fig. 468).

On beech log, Mountain Wood, East Horsley, 11 Oct. 1953 (type in Herb. Kew), 18 Oct. 1953 and 6 Nov. 1954. The colours, especially as seen from above, give this agaric the appearance of a Galerina, in fact I mistook it for *G. unicolor* (= *marginatus*) before I gathered it. Of the other yellow species with cellular cap cuticle, it differs from *P. lutescens* in the more pronounced yellow colours and facial cystidia narrower at apex, from *P. xanthophaeus* in yellow then ochraceous gills and brighter cap, from *P.*

splendidus in the cap being not distinctly bicoloured and the yellow not so deep, striate moist cap and facial cystidia narrower at apex, and from *P. luteovirens* in yellow stem and yellowish gills and cap not lemon- or greenish yellow.

PLUTEUS GODEYI Gillet (Figs. 469, 470)

An agaric was recorded under this name by Pearson (these *Trans.* **22** (1946), 196) from Wheatfen, Norfolk, collected by E. A. Ellis. I have now had the opportunity to examine fresh material also collected by E. A. Ellis on the spot and am sure this should have been named *P. thomsonii* (= *P. cinereus*) (see notes on *P. thomsonii* for explanation of synonymy). Kühner & Romagnesi (1953) have described a similar agaric under the name *P. godeyi*, the only differences between it and their *P. cinereus* being absence of marked veins on the cap and habitat on soil. I have made many collections of *P. thomsonii*, best recognized by the grey, at first white-floccose stem, marginal cystidia often with long fine points, and absence of facial cystidia, and have found specimens without veins growing on wood as well as specimens with veins apparently on soil. Some of the specimens from Norfolk were veined and some were not, the smaller ones being usually but not always without veins. In his later account of *Pluteus* Kühner (1956, p. 203) abandoned the epithet *godeyi* and renamed the form without veins *P. cinereus* forma *evenosus*. I have gone further than this and prefer to regard all these as the same species, *P. thomsonii*, which may or may not have veins on the cap.

P. godeyi s. J. Lange, however, seems to me to be a different, paler and slightly olive-tinged agaric and one which fits the original diagnosis of *godeyi* more satisfactorily. I have made one collection I think to be the same and give a description below. For this reason I have kept *P. godeyi* in the 'List' in the sense of J. Lange. It remains to be proved, however, whether this is distinct from *P. olivaceus*.

Cap 20 mm., expanded, slightly umbonate, *olive-grey or olive-sepia at margin, centre slightly darker* and more distinctly sepia, striate at margin when moist, drying paler and opaque and slightly radially rugulose at or round centre, which may have a pruinose 'bloom'. *Gills* free, ventricose, whitish pink, subcrowded, L 34–42 l 1–3, edge white flocculose when fresh. *Stem* 40–45/2 mm., equal, *white with slight silvery grey tinge, greenish grey at summit and at base when moist*, white silky striate, apex slightly white pruinose. *Flesh greyish white or horn colour, drying white* in centre of cap. *Smell* none. *Spores* subglobose, 6–8/5–6 μ. *Marginal cystidia* variable, clavate to lageniform, 38–60/12–20 μ. *Facial cystidia lageniform* (Fig. 469), all much the same length, 56–64/16–22 μ, apex *ca.* 8–12 μ with a few fusiform ones. Cap cuticle cellular (cells spheropedunculate or pyriform, *with a few lageniform ones projecting through*, about 12–16 μ diam.) (Fig. 470).

On beech stump, Polesden Lacey, Surrey, 5 Oct. 1955. This resembles most closely *P. cinereofuscus*, which has a white stem, or not more than slightly grey at base, is more robust, and has larger facial cystidia and a strictly cellular cuticle. It also resembles *P. olivaceus*, but that is a darker olive and has a strictly cellular cuticle and larger facial cystidia. It remains to be seen if these differences justify separation as a species, and if so, if my choice of epithet for the one described above is correct; if they are not distinct it might be better to abandon the epithet *godeyi* altogether.

Pluteus griseopus sp.nov. (Figs. 176, 472)

Pileus 14–42 mm., e convexo expansus vel leviter depressus, interdum obtuse umbonatus, umbrinus vel fuscobrunneus, vulgo ad marginem pallidiore coloratus, jove pluvio ad marginem striatus, ad discum nunc pulverulentus nunc eleganter rugulosus rariore venosus. Lamellae liberae, interdum remotae, ventricosae, ex albo albidae dein incarnato-albidae postremo obscuriore incarnatae, subconfertae, L ca. 40–50 l 0–3, ad aciem integrae vel leviter flocculosae. Stipes 15–45/1½–6 mm., aequalis vel sursum attenuatus, interdum ad basim incrassatus, griseus, primo albo- vel albido-floccosus dein albosericeo striatus, ad apicem vulgo albopruinosus, e farcto cavus. Caro pilei alba vel albida, stipitis grisea vulgo ad corticem praecipue ad apicem obscuriore grisea. Odor nullus. Sporae subglobosae vel late ovoideae, 6–8/5–6½ μ. Basidia 4-sporigera. Cystidia aciei lamellarum diversiformia, clavata, fusiformia vel lageniformia ad apicem lata, 20–70/12–28 μ. Cystidia faciei lamellarum vesiculoso-fusiformia vel lageniformia ad apicem latissima (45)50–90/16–32 μ ad apicem 12–20 μ lata (Fig. 472). Cellulae cuticulae cellularis spheropedunculatae vel pyriformes, 10–30 μ latae, brunneo-vacuolatae.

Ad terram, Stinchcombe, Glos, 13 Sept. 1955 (typus in Herb. Kew.); ad lignum Fagi, Hodgson's Wood, Earley, Berks, 25 Oct. 1955. A P. nano stipite griseo cystidiis faciei lamellarum vesiculoso-fusiformia ad apicem latissima facile distinguitur. P. pallescens a pileo hygrophano, stipite albo vel sordide brunneolo differt. P. phlebophorus a stipite albo vel sordide brunneo, pileo exstriato conspicue venoso, statura vulgo robustiora differt.

Cap 14–42 mm., convex then expanded or slightly depressed, sometimes obtusely umbonate, *vandyke or umber often paler at margin*, *striate* at margin when moist, centre sometimes with pruinose 'bloom', often finely rugulose more rarely veined. *Gills* free, sometimes remote, ventricose, white then whitish or pinkish white finally deeper pinkish, subcrowded, L *ca.* 40–50 l 0–3, edge even or slightly flocculose. *Stem* 15–45/1½–6 mm., equal or attenuated upwards, sometimes thickened at base, *grey*, *white- or whitish floccose at first then white silky-striate*, apex often white pruinose, stuffed then hollow. *Flesh* white or whitish in cap, *grey in stem*, *often darker grey in cortex* especially at apex or at base. *Smell* none. *Spores* 6–8/5–6½ μ, subglobose or broadly ovoid. *Basidia* 4-spored. *Marginal cystidia* variously shaped, clavate, fusiform or broadly lageniform with broad apex, 20–70/12–28 μ. *Facial cystidia* vesiculose-fusiform or lageniform *with very broad apex*, (45)50–90/16–32 μ, *apex 12–20* μ (Fig. 472). Cells of cellular cap cuticle spheropedunculate or pyriform, 10–30 μ diam. with brownish vacuolar pigment.

On the ground (probably on buried wood), Stinchcombe, 13 Sept. 1955 (type in Herb. Kew); on beech stump, Hodgson's Wood, Earley, 25 Oct. 1955; Norbury Park, Mickleham, Surrey, 3 Oct. 1952. Differs from *P. nanus* in the distinctly grey stem, which is floccose at first, and broader facial cystidia. *P. pallescens* is distinctly hygrophanous and has a white, whitish or dirty brownish stem, not floccose at first, but has similar facial cystidia. *P. phlebophorus* has a white, whitish or dirty brownish stem, not floccose at first, the cap not striate and more conspicuously veined, and is perhaps more robust.

PLUTEUS LUTEOVIRENS Rea (Fig. 500)

I have examined the type material of this species and found it to have a cuticle with cells about 10–30 μ diam. and have no hesitation in referring to this name a collection made by T. J. Wallace at Kenley Bottom, Spaxton, Som., on 13 Aug. 1958 on soil amongst bits of wood. See key, § 35, for salient features of the species; Fig. 500 for facial cystidia of the Somerset collection.

PLUTEUS LUTESCENS (Fr.) Bres. (Fig. 471)

This very common agaric, listed as a variety of *P. nanus* in the past, I have found very distinct and am following others in regarding it as a good species. It is best recognized by the broad vesiculose-fusiform or slightly lageniform facial cystidia with a very broad apex, 56–100/16–40 μ, apex when lageniform 14–24 μ (Fig. 471), and also the stem which is distinctly yellow at least at the base. The cap colour varies a good deal and may be entirely sepia or tinged yellow in places, usually near margin. The only other yellow *Pluteus* with cellular cuticle and similar broad facial cystidia is *P. splendidus*, the cap of which is bicoloured, in part pure bright yellow, in part sepia or vandyke. See key, § 38, for details. *P. xanthophaeus* is sometimes nearly as yellow but has narrower facial cystidia of a different shape.

PLUTEUS MURINUS Bres., *Ann. Mycol. Berl.* **3** (1905), 160; *Bres. Ic. Mycol.* p. 538; (Fig. 184)

I found an agaric corresponding very convincingly to Bresadola's description and plate on the ground in Norbury Park, Mickleham, Surrey, 17 Oct. 1953. Since this species is not well known I give a description of the collection:

Cap 50 mm., expanded slightly depressed, *sepia* at centre (colour of *P. cervinus* or slightly darker), slightly paler at margin, *cuticle disrupted towards margin showing large patches of white flesh* and making the margin appear striate-sulcate from radial fissures in the cuticle with white flesh showing in between (Fig. 184), centre minutely pilose-scaly under lens. *Gills* free remote, pink, subcrowded, L 64 l 0–1. *Stem* 65/7 mm. (11 mm. in bulb), slightly attenuated upwards from *almost marginate bulbous base*, *white with a few sepia-brown fibrils near base*, rather firm. *Flesh* white, slightly brownish in stem. *Smell* none. *Spores* subglobose or broadly ellipsoid, 6–8/5–6 μ. *Marginal cystidia* variable, clavate to lageniform, 36–64/10–22 μ. *Facial cystidia* clavate or *clavate with short broad appendix at apex or broadly lageniform with very short neck*, *ca.* 60–70/20–22 μ. Cells of cap cuticle subcylindric or slightly fusiform, (50)80–140/10–14(18) μ, with brownish contents.

The striking appearance of the cap, the bulbous stem and probably the habitat on the ground should make this agaric readily recognizable. *P. pearsoni* is rather similar microscopically but the cap is grey and does not crack in the same way. I suspect that when young the cap of *P. murinus* is entirely minutely pilose-scaly; this seems to be a rare fungus in Britain and elsewhere.

PLUTEUS NANUS (Pers. ex Fr.) Kummer (Fig. 475)

Although there can be no doubt that more than one species has been included under this name in the past, I think it is quite possible to recognize in the field one that agrees with the original diagnosis sufficiently well to retain the name *nanus*. The essential features are cap 'rugoso umbrino, fuligine consperso' and stem 'solide tenui glabro argenteo' (*Syst. Mycol.* I, 199). It was originally described also as being small. The one I have described as *P. griseopus* would agree in size and cap characters but the grey stem and flesh have made me regard it as different. That which I have described as *P. pallescens* comes nearer to *P. nanus* but as there is no mention of a colour change due to a hygrophanous cap in Fries's diagnosis I regard that also as a different species. These two have facial cystidia of the fusiform-vesiculose or broadly lageniform type (Figs. 472, 473). However, another agaric, described below, has the correct cap characters and white stem but differs from the other two in having narrower facial cystidia (see Fig. 475). Kühner & Romagnesi (1953) have abandoned *nanus* and included a new name, *satur*, for *P. nanus* f. *minor* Bres. From the rather inadequate description they give (1953, p. 424) I thought this was my *nanus*, but from the fuller descriptions of *satur* given in 1956 I found this was not so. The drawing of Romagnesi (1956, fig. 25) shows the broad type of cystidia and he describes a partially coloured stem and hygrophanous cap, whereas Kühner shows apparently the narrower lageniform type of facial cystidia (p. 208, fig. 16*c*) and there is no mention of hygrophanous for the cap. In view of this disparity in these descriptions I prefer not to use the epithet *satur*. It seems to me from Romagnesi's description that his species is likely to be the same as that described by me as *P. pallescens* and Kühner's is my *P. nanus*. Because there is insufficient microscopical information in Bresadola's description I prefer not to quote his plate for any of these, but I give a description of the not uncommon agaric I believe to be the same as *Agaricus nanus* Pers. ex Fr., 1821, and include it in the 'List' as *P. nanus*.

Cap 7–47 mm., convex then expanded often slightly obtusely umbonate, *sepia to dark vandyke*, often slightly paler at margin, fading very slightly with age, *not striate* or only at margin when moist, slightly rugulose at centre especially, and with pruinose 'bloom' under lens, not veined. *Gills* free, ventricose, white then pale pink, later deeper pinkish, subcrowded, L *ca.* 32–40 l 0–3, edge white flocculose under lens. *Stem* 25–55/1½–5 mm., equal or slightly thickened at base, *silvery white then whitish* or very pale dirty brownish when old or handled, *white silky-striate*, solid, *soft-fibrous*, easily squashed when old. *Flesh* greyish or tinged sepia in cap, soon drying whitish, pale sepia-horn or dirty brownish in upper stem, whitish below. *Smell* none. *Spores* 5–8/4½–7 μ, subglobose. *Marginal cystidia* variable, clavate fusiform or lageniform, rarely utriform, 38–76/10–24(30) μ. *Facial cystidia* mostly *fusiform-lageniform with long tapering neck*, a few more distinctly lageniform with less tapering neck, 68–96/16–30 μ, *apex 6–12 μ* (fig. 475). Cells of cap cuticle spheropedunculate or pyriform 10–44 μ diam. with brownish vacuolar pigment.

Often apparently on ground, also on wood: Bindon Landslip, Rousdon, Devon, 12 Dec. 1958; Stinchcombe, Glos., 13 Sept. 1955; Membury, Devon, 18 Sept. 1955; Darnaway Forest, Morayshire, 24 Sept. 1955. Usually small but cap may be 30–47 mm. at times. The slight darkening of the stem is due to the removal or damage of the outer covering of white silky fibrils as far as I can see. *P. phlebophorus* has a relatively firm stem, white all through to start with but discolouring pale dirty brownish or even slightly yellowish with age, becoming hollow, snapping easily when fresh, and it has a characteristic acidulous smell as well as a consistently veined cap, which is often sepia with a slight yellowish tinge. These differences are difficult to describe convincingly, but in the field these two species can be quickly distinguished.

Pluteus olivaceus sp.nov. (Figs. 477, 478)

Pileus 12–30 mm., e convexo vel conico-convexo obtuse umbonato expansus interdum umbonatus, obscure olivaceo-fuscus ad discum primo caesiotinctus dein obscure fuscus, siccitate griseus vel colore cornus tinctus ad discum obscuriore olivaceo-griseus vel -fuscus, jove pluvio striatus, sub lente ad discum pruinatus vel minute radialiter rugulosus. Lamellae liberae, ventricosae, e pallidissimo griseo vel leviter olivaceo-griseo pallide griseae dein incarnato-tinctae, subconfertae, L 40–50 l 1(3), ad aciem albo vel pallido flocculoso-denticulatae. Stipes 50–88/2–4 mm. (ad basim 4–8 mm.), aequalis ad basim incrassatus vel sursum attenuatus, ex albo albidus vulgo infra olivaceo-griseo tinctus, laevis vel minute sericeo-striatus, cavus, ad basim albo-tomentosus vel strigosus. Caro pilei obscure olivaceo-fusca siccitate olivaceo-grisea, stipitis supra alba vel albida infra pallide olivaceo-tincta vulgo a carne pilei manifeste delineata. Sporae subglobosae vel late ovoideae, 6–9/5–7 μ. Basidia 4-sporigera, 32–44/8–10 μ. Cystidia aciei lamellarum clavata (38–60/16–22 μ), fusiforme-lageniformia vel lageniformia vulgo ad apicem obtusa 40–62(80)/12–20(24) μ ad apicem 6–12(14) μ. Cystidia faciei lamellarum lageniformia vel fusiforme-lageniformia (60) 70–94/20–36 μ ad apicem 8–15 μ (Fig. 477). Cellulae cuticulae pilei pyriformes vel spheropedunculatae 38–76/14–50(60) μ pallide olivaceo-brunneo vacuolatae (Fig. 478).

Ad ligna Fraxini, Allerford Wood, Bossington, Som., 7 Nov. 1959 (typus in Herb. Kew.). A P. cinereofusco pileo olivaceo-brunneo margine pellucido-striato, stipite non albo, habitu differt. P. godeyi a coloribus pallidioribus cellulis cuticulae pilei diversiformibus differt.

Cap 12–30 mm., convex or conico-convex obtusely umbonate then expanded umbonate or not, *dark olive-sepia* with slate-grey tinge at centre, *then dark sepia or olive-sepia in centre with paler olive-brownish margin, hygrophanous,* drying grey-horn with olivaceous-grey or pale olive-sepia centre, *pellucid-striate when moist,* with pruinose bloom in centre or finely radially rugulose. *Gills* free, ventricose, *very pale grey or greyish with slight olive tinge* then pale grey-horn finally pinkish grey-horn, subcrowded, L 40–50 l 1(3), edge white or paler than rest and flocculose-denticulate. *Stem* 50–88/2–4 mm. (4–8 mm. at base), equal with thickened base or attenuated upwards, *white then whitish, often tinged olive-horn or olive-grey in lower part,* smooth or very minutely silky-striate, hollow, base white tomentose or strigose. *Flesh olive-sepia in cap,* drying paler and *sharply marked off from that of stem,* which is white or whitish sometimes tinged olive-grey or -ochraceous in lower part. No *smell* noted. *Spores* subglobose or broadly ovoid, 6–9/5–7 μ. *Basidia* 4-spored, 32–44/8–10 μ. *Marginal cystidia* clavate (38–60/16–22 μ), fusiform-lageniform, or lageniform, usually with obtuse rather broad apex, 40–62(80)/12–20(24) μ, apex 6–12(14) μ. *Facial cystidia* lageniform or fusiform-lageniform (60) 70–94/20–36 μ, apex 8–15 μ

(Fig. 477). Cap cuticle cellular, cells pyriform or spheropedunculate, 38–76/14–50(60) μ (Fig. 478) with pale olive-brownish vacuolar pigment (daylight in water).

On ash twigs, singly but near together, Allerford Wood, Bossington, Som., 7 Nov. 1959 (type in Herb. Kew).

Differs from *P. cinereofuscus*, with similar microscopic features, in the moist cap being olive-brown and pellucid-striate at margin, drying greyish with olivaceous centre, flesh of cap also dark olive-brown when moist, drying paler and sharply marked off from that of stem, and stem soon tinged olivaceous below and not white. *P. cinereofuscus* has a more glaucous-grey cap and is often found in tufts and seems to be more robust; it may also differ in habitat being found in beech leaves or on stumps (? always of beech). *P. godeyi* (s. J. Lange) is paler and seems to have a different cap cuticle (see p. 355). Further field work is necessary on this group to establish the status of these three species.

Pluteus pallescens sp.nov. (Fig. 473)

Pileus 20–32 mm., e convexo expansus ± planus, interdum leviter obtuse umbonatus, umbrinus vel obscure fuscus vulgo ad marginem pallidiore coloratus, hygrophanus, siccitate pallide fusco-griseus vel pallide umbrinus interdum ad discum obscuriore coloratus, haud raro ad discum eleganter reticulato-venosus vel rugulosus, jove pluvio pellucido- vel sulcato-striatus, jove sicco opacus vel leviter sericeo-nitidus. Lamellae liberae, ventricosae, ex albo incarnatae, confertae, ad aciem minute albido flocculoso-fimbriatae. Stipes 35–55/2–4 mm., aequalis vel sursum attenuatus, ex albo vel albido sordide cremeo vel pallide sordide luteolo sursum decolorans, minute albo-sericeo striatus, ad apicem leviter pruinosus, e farcto anguste cavus, primo aliquantum firmus. Caro pilei concolorata siccitate pallide fusco-grisea, stipitis ex albo vel albido pallide sordide luteola interdum fusco-griseo tincta. Odor nullus. Sporae subglobosae, 5–7/5–6 μ. Cystidia aciei lamellarum clavata vel vesiculoso-fusiformia, rariore lageniformia, 40–80/12–40 μ. Cystidia faciei lamellarum clavato- vel vesiculoso-fusiformia, 44–80/18–40 μ (Fig. 473). Cellulae cuticulae cellularis pilei spheropedunculatae vel pyriformes, 14–40 μ latae, brunneo-vacuolatae.

Ad terram prope lignum Fraxini, Wheatfen Carr, Surlingham, Norfolk, 7 July 1958 (typus in Herb. Kew.). A pileo distincte hygrophana a P. nano et P. griseopode distinguitur. P. nanus a cystidiis faciei lamellarum angustiore lageniformibus, P. griseopus a stipite griseo primo albofloccoso differunt.

Cap 20–32 mm., convex then expanded ± plane, sometimes slightly obtusely umbonate, date-brown, umber or vandyke, usually with darker centre and paler margin, *hygrophanous*, drying pale grey-brown or pale date-brown sometimes darker at centre, sometimes finely reticulate-veined or rugulose at centre, when moist *pellucid-striate or sulcate-striate in outer half*, when dry matt or slightly silky-shiny. *Gills* free, ventricose, whitish then pinkish, crowded, edge minutely whitish flocculose-fimbriate. *Stem* 35–55/2–4 mm., equal or attenuated upwards, *white or whitish then discoloured dirty cream* or pale dirty yellowish from base, minutely white silky-striate, apex slightly pruinose, stuffed then minutely hollow, fairly firm at first. *Flesh* of cap concolorous drying pale brownish grey, of stem white or whitish then pale dirty yellowish or sometimes tinged brownish or grey. *Smell* none. *Spores* subglobose, 5–7/5–6 μ. *Marginal cystidia* clavate or vesiculose-fusiform, more rarely lageniform, 40–80/12–40 μ. *Facial cystidia clavate- or vesiculose-fusiform*, 44–80/18–40 μ (Fig. 473). Cells of cap cuticle spheropedunculate or pyriform, 14–40 μ diam., with brownish vacuolar pigment.

On ground near ash log, Wheatfen Carr, Surlingham, 7 July 1958 (type in Herb. Kew).

The distinctly hygrophanous cap distinguishes it from both *P. nanus*, which also has narrower lageniform facial cystidia, and *P. griseopus*, which has a grey stem. I think this is *P. umbrinellus* (Sommerfelt) Bres. s. Bres., Huijsman but not the original *Agaricus umbrinellus* Sommerf. which is said to have the stem 'radicato, tenaci' and the cap margin 'fimbriato', and may not be a *Pluteus* at all. As previously explained (p. 358) I think Romagnesi's description of *P. satur* may be of *P. pallescens*, but I have not used the epithet *satur* because the Latin diagnosis not only makes no mention of the cap being hygrophanous but says 'vix striatus'.

Pluteus pearsonii sp.nov.

Pileus 40–70 mm., e convexo expansus, vulgo obtuse umbonatus, fuliginosus, nigro-griseus vel praecipue ad discum griseo-fuscus, primo totus velutino-squamulosus dein cuticula hac atque illac diffracta carne alba exposita, ad discum persistentiore confertiore squamulosus. Lamellae liberae, vulgo late remotae, ventricosae, ex albo incarnato-albidae dein obscuriore incarnatae, confertae, L ca. 80–100 l 0–1, ad aciem crenulatae. Stipes 35–65/3–10 mm. (ad basim < 12 mm. diam.), aequalis vel sursum attenuatus ad basim incrassatus vel submarginato-bulbosus, interdum tortus vel compressus, albus dein sordide brunneolus, infra squamulis minutis fibrillosis fuliginosis vel griseo-fuscis obtectus, ad apicem primo albo-pruinosus, cavus, aliquantum firmus. Caro alba vel in stipite sordide brunneolo-tincta. Odor et sapor nulli. Sporae subglobosae vel late ovoideae, 5–7/4–5 μ. Cystidia aciei lamellarum clavatae ventricoso-fusiformia vel lageniformia, 40–90/14–35 μ. Cystidia faciei lamellarum late ventricoso-lageniformia cervice aliquantum breve obtuse, ca. 50–60/16–20 μ. Cellulae cuticulae filamentosae pilei subcylindricae interdum irregulariter formatae vel ramosae, interdum fuligineo-coloratae, 60–150/6–20 μ.

Ad terram vel in scobe: Norbury Park (ad terram), Mickleham, Surrey, 8 Oct. 1949 (legit A. A. Pearson, typus in Herb. Kew.), 8 Oct. 1950 et 20 Oct. 1951; Mountain Wood (in scobe), East Horsley, Surrey, 18 Oct. 1953; P. murino maxime affinis, sed a coloribus fuliginosis vel griseo-fuscis, cuticula pilei minus diffracta, stipite infra fuligineo-squamuloso differt. P. plautus (Weinm.) Gillet sensu Pearson non al. idem est.

Cap 40–70 mm., convex then expanded, often obtusely umbonate, *soot-black or blackish-grey* (colour of *Tricholoma terreum*) or tinged grey-sepia (more especially at centre), *entirely velvety-scaly at first* then cuticle often disrupts in places showing white flesh, centre persistently and more densely scaly. *Gills* free, often remote leaving wide space between base of gill and stem apex, ventricose, white then pinkish white, finally deep pinkish, crowded, L *ca.* 80–100 l 0–1, edge crenulate. *Stem* 35–65/3–10 mm. (< 12 mm. at base), equal or attenuated upwards from *swollen or submarginate-bulbous base*, sometimes twisted or compressed, *white then tinged dirty brownish below, with minute blackish or grey-brownish fibrillose scales at least on lower part*, apex white pruinose at first, hollow, fairly tough. *Flesh* white or slightly brownish in stem. *Smell* and *taste* none. *Spores* subglobose or broadly ovoid, 5–7/4–5 μ. *Marginal cystidia* clavate, ventricose-fusiform or lageniform, 40–90/14–35 μ. *Facial cystidia broadly ventricose-lageniform often with rather short obtuse neck*, *ca.* 50–60/16–20 μ. Cells of cap cuticle subcylindric, sometimes irregularly shaped or branched, 60–150/6–20 μ, sometimes blackish.

On ground or in sawdust: Norbury Park (on the ground), Mickleham, 8 Oct. 1949 (legit A. A. Pearson; type in Herb. Kew), 8 Oct. 1950, 20 Sept. 1951; Mountain Wood (in sawdust), East Horsley, 18 Oct. 1953.

Resembling *P. murinus* in some ways but differs in being predominantly blackish or grey-brown, cap cuticle not disrupting so strongly and the blackish or grey-brownish scales on lower part at least of stem. This is *P. plautus* (Weinm.) Gillet s. A. A. Pearson as recorded and described by him (these *Trans.* **35** (1952), 108), but not *P. plautus* s. J. Lange, Métrod, a sepia-brown agaric coloured like *P. cervinus* and entirely minutely scaly and growing on coniferous wood according to these authors (see below). Assuming the latter to be the original *Agaricus plautus* Weinm., which I am not prepared to dispute, a new name is required for Pearson's agaric. I have great pleasure in naming this species after him, especially as I was present when he first found it and subsequently gathered it from the same area myself. *P. plautus* var. *terrestris* Bres., as noted by Pearson, is probably the same species, though Bresadola's plate shows the stem entirely black-scaly whereas our collections have black scales only on the lower half to one-third.

PLUTEUS PLAUTUS (Weinm.) Gillet

P. plautus, as described by J. Lange and Konrad & Maubl. and in more detail by Métrod, for which there is no authentic British record, grows on coniferous wood, has a cap cuticle consisting of rather short sometimes erect cells, the cap being brown dotted-scaly as in *P. punctipes*, a deciduous wood agaric with longer repent cells in the cap cuticle. *P. podospileus*, also on deciduous wood and brown dotted-scaly, is usually darker and has a partly cellular cap cuticle. Macroscopically any of these three could represent the original *Agaricus plautus* Weinm. (see above) but I think it best to retain the epithet *plautus* for Métrod's fungus and remove it from the British list.

PLUTEUS PODOSPILEUS Sacc. & Cub. (Figs. 178–179, 479–481)

Saccardo and Cuboni gave this as a new name for *Agaricus* (Pluteus) *spilopus* Berk. & Broome (*Notes on British Fungi*, no. 1856 and Cooke Pl. 310 (325)), but not *A.* (P.) *spilopus* Berk. & Broome (*Ceylon Fungi*), a tropical terrestrial agaric not known in Britain. One of the characters stressed for *podospileus* was 'stipite nigro-punctato' and another 'pileo striato-ruguloso', whilst the spores were given as 4 μ diam. When collecting in Norfolk I found a Pluteus with a remarkably dark brown dotted stem, the cap appearing striate from the uneven concentration of scales, and spores $4–5(6)/3\frac{1}{2}–5(5\frac{1}{2})\ \mu$. Later in the same wood I made another collection of what was obviously the same species but with slightly larger spores, $5–7(8)/4\frac{1}{2}–6\ \mu$. None of Cooke's material was preserved but in view of these characters I am reinstating *podospileus* in the British list since it has two features distinguishing it from the macroscopically similar *P. plautus* and *P. punctipes*, namely the very dark pigment in the cells of the cap and stem scales (thus accounting for their black-brown punctate appearance), and the mixed cap cuticle of both elongate fusiform and shorter spheropedunculate cells, as in *P. minutissimus* which, however, lacks the dark pigment and the stem is not so conspicuously or completely scaly. Spore size I regard as quite uncritical for these species. Here is a redescription of *P. podospileus*:

Cap 13–30 mm., convex then expanded, sometimes obtusely umbonate, *umber or deep date-brown often dark vandyke or blackish umber at centre, entirely minutely velvety punctate scaly*, scales often densest at centre, when moist sometimes pellucid-striate at margin, but when drier margin often sulcate and appearing striate due to the cuticle cracking radially or the *scales being concentrated radially along the crests of the ridges and more dispersed in the sulcae*, sometimes exposing the white flesh in places, extreme margin sometimes dark punctate-scaly like centre. *Gills* free, ventricose, white then pinkish, subcrowded, edge whitish flocculose under lens, occasionally becoming brownish near cap edge in places. *Stem* 11–40/1–3 mm., equal or attenuated upwards, sometimes with small basal bulb, white above, whitish or slightly greyish below, then dirty whitish or pale brownish, *entirely minutely sepia, date- or black-brown punctate-scaly* except at apex (Figs. 178, 179), minutely silky striate beneath scales, stuffed or narrowly hollow, fairly tough and tense when fresh. *Flesh* white or whitish in cap, pale horny or dirty brownish in stem, sometimes darker sepia at base. *Smell* none or faintly acidulous or slightly winey when cut. *Spores* subglobose or broadly ovoid, 4–7(8)/3½–6 μ. *Basidia* 4-spored, 24–30/7–8 μ. *Marginal cystidia* from clavate or fusiform to utriform-lageniform, 20–70/10–32 μ. *Facial cystidia clavate, vesiculose or broadly fusiform-clavate*, 30–64/12–24 μ (Fig. 481). Cells of cap scales (1) spheropedunculate, pyriform or shortly clavate, 24–80/12–54 μ with pale brownish contents; (2) *erect, fusiform, often rather pointed at apex*, 70–150/12–26 μ, with pale brownish contents, *sometimes also dark sepia or black-brown pigment forming large body or scattered granules* chiefly at base or apex of cell (Fig. 479), this pigment may also be seen in the narrower penultimate cell (3–6 μ diam., Fig. 480). Cells of stem scales cylindric or slightly fusiform, 3–14 μ diam., with pale brownish contents, many also with black-brown pigment as in those of cap scales.

On old ash log, Wheatfen Carr, Surlingham, Norfolk, 23 Oct. 1956; on elm log, Tuck's Plantation, Surlingham, Norfolk, 9 July 1958; on rotten alder branch, Alder Carr, Freshfield, Lancs, 16 Sept. 1959. Readily recognized by black-brown pigment in some of the cells of the scales on cap and stem (seen in H_2O and daylight) and the mixed cap cuticle. This has plainly nothing to do with the terrestrial tropical *P. spilopus* in my opinion and Saccardo & Cuboni were quite correct in renaming the British agaric. In Rea (*British Basidiomycetae*, p. 60) *P. podospileus* is incorrectly cited as *P. spodopileus*.

Pluteus punctipes sp.nov. (Figs. 177, 482, 483)

Pileus 18–45 mm., e convexo expansus vulgo obtuse umbonatus, interdum postremo depressus, umbrinus vel obscure fuscus, interdum juventute obscure violaceo-fuscus vel fere niger, senectute ad marginem vel fere totus pallidiore fuscus vel sordide luteolo-brunneus, totus squamulis obscurioribus minutis fibrillosis haud raro acutis ad marginem sparsiore dispersis vel postremo fere absentibus obtectus, jove pluvio ad marginem striatus, jove sicco interdum leviter ruguloso-sulcatus vel ad discum rugulosus. Lamellae liberae, ventricosae, ex albido fuscotinctae dein incarnato-griseo-fuscae vel brunneoloncarnatae, confertae, L 40–64 l 1–3, ad aciem vulgo conspicue flocculosae interdum obscuriore coloratae. Stipes 20–60/2–6 mm., aequalis, rariore sursum attenuatus, vulgo ad basim incrassatus vel conspicue bulbosus, colore pilei concoloratus vel pallide brunneolus, ad apicem vulgo albidus vel pallidiore fuscus, exceptione apicis squamulis eis pilei similibus totus obtectus, infra squamulas albo- vel brunneolo-sericeo-striatus, farctus. Caro pilei alba vel albida, stipitis brunneola vel sordide luteola vulgo ad apicem obscuriore colorata et a carne pilei manifeste denotata. Odor debilis gratus (sectus magis olet) interdum vineus. Sporae subglobosae, 5–7/4–6½ μ. Cystidiis aciei lamellarum clavatae, fusiformia vel lageniformia 30–80/10–24 μ, interdum brunneolo-vacuolata. Cystidia faciei lamellarum fusiformia vel lageniformia vulgo cervice breve aliquantum late, 70–100/14–30 μ ad apicem 9–14 μ lata, vulgo brunneolo-vacuolata (Fig. 483). Cellulae hypharum squamularum pilei cylindrico-fusiformes, cellulae ultimae interdum ramosae vulgo ad apicem aliquantum acutae, 110–300+/10–20 μ, brunneolo-vacuolatae (Fig. 482). Cellulae ultimae squamularum stipitis breviores, 60–120/6–10 μ vulgo fasciculatae.

Ad ramulos et ligna praecipue Fagi, Juniper Hill, Mickleham, Surrey, 12 Oct. 1952 (typus in Herb. Kew.). Facies omnino P. plauti et P. podospilei sed a characteribus cuticulae pilei facile distinguitur. P. umbrosus a squamulis crassioribus, statura robustiore, acie lamellarum constanter obscuriore colorata, margine pilei conspicue fimbriato-lacerato jove pluvio exstriato differt.

Cap 18–45 mm., convex then expanded, often obtusely umbonate, sometimes finally depressed, sepia, umber or vandyke, often darker at the centre, when young dark sepia, dark violaceous-brown to almost black, then paler *sepia or dirty yellowish brown* (especially in outer part), *entirely covered with minute rather pointed fibrillose darker scales*, more scattered or almost absent at margin, striate at margin when moist, sometimes slightly wrinkled-sulcate or rugulose at centre when dry. *Gills* free, ventricose, whitish soon tinged sepia then pinkish grey-brown or brownish pink, crowded, L 40–64 l 1–3, edge ± conspicuously flocculose, sometimes darker brownish in places. *Stem* 20–60/2–6 mm., equal or more rarely attenuated upwards, usually with swollen or well-marked bulbous base, concolorous with cap or pale brownish, generally paler or whitish at apex, *entirely minutely punctate-scaly like cap* except at white silky apex, white or brownish silky-striate beneath scales, stuffed. *Flesh* of cap white or whitish, of stem brownish or dirty yellowish often darker at apex and sharply marked off from that of cap. *Smell* faint pleasant (stronger when cut), sometimes winey. *Spores* subglobose, 5–7/4–6½ μ. *Marginal cystidia* clavate, fusiform, or vesiculose-lageniform, 30–80/10–24 μ, with or without brownish vacuole(s). *Facial cystidia fusiform or lageniform usually with short rather broad neck*, 70–100/14–30 μ, apex *ca.* 9–14 μ, usually (Fig. 483) with brownish vacuole(s). Cells of scales on cap cylindric-fusiform, *end cells sometimes branched often with short rather pointed apex*, 110–300+/10–20 μ, with brownish vacuolar pigment (Fig. 482); below these are narrower clamped hyphae, 3–8 μ diam. Cells of stem scales similar but rather smaller, end cells about 60–120/6–10 μ, often in bunches.

On twigs and logs, especially of beech, rather common. Norbury Park, Mickleham, 10 Nov. 1951, 26 Sept. 1952, 13 Oct. 1956; Juniper Hill, Mickleham, 12 Oct. 1952 (type in Herb. Kew); Leigh Woods, Bristol, Som., 14 Sept. 1955; Darnaway Forest, Morayshire, 24 Sept. 1955. Macroscopically resembling *P. plautus* s. J. Lange, Métrod and *P. podospileus*, but readily separated by cap cuticle characters (see key, § 15). *P. umbrosus* is more coarsely scaly, more robust and the gill edge is consistently darker, and the edge of the cap markedly fimbriate-lacerate and not striate when moist. It is surprising that this rather common agaric does not appear to have been described previously.

PLUTEUS THOMSONII (Berk. & Br.) Dennis (Figs. 180–183, 486)

Dennis (these *Trans.* **31** (1948), 206) first established that *Agaricus* (Entoloma) *thomsonii* Berk. & Br. was a species of *Pluteus*, as a result of his examination of type material, and stated that it was 'almost certainly *P. cinereus* Quélet (1884)'. Singer (these *Trans.* **39** (1956), 216), however, considered *A.* (E.) *thomsonii* to be conspecific with *P. cinereofuscus* J. Lange, 'having observed identical material in the Caucasus Mountains', but this synonymy cannot be accepted since the macroscopic features of *thomsonii* and *cinereofuscus* are quite dissimilar: thus (1) the original diagnosis of *A.* (E.) *thomsonii* (*Ann. Mag. nat. Hist.* Ser. 4, XVII (1876), 131) describes the cap 'griseo tomentoso, costis reticulato ornato' and the stem 'pallidiore fibrilloso tomentoso', whereas J. Lange says of *P. cinereofuscus* 'cap glaucous grey, slightly striate-rugulose at the edge, sub lente micaceous powdery' and 'stem white, naked, slightly silky striate'; (2) there is no mention of strong venation for *cinereofuscus* nor have I ever found the cap more than rugulose-wrinkled whereas this venation is often very striking in *thomsonii*. Furthermore, Dennis's original drawings of the gill edge of type material of *thomsonii* clearly show rather pointed cystidia unlike the relatively obtuse marginal cystidia of *cinereofuscus*. I have not been able to find any facial cystidia in the type material myself nor could I satisfactorily identify cap cuticle cells. On account of the stem of *thomsonii* being described as fibrillose tomentose and not white, and the cap strongly reticulate-veined, also the rather pointed cystidia on the gill edge, all characters of *P. cinereus*, I agree with Dennis that *A.* (E.) *thomsonii* (1876) is conspecific with *P. cinereus* (1884), the former having priority. I could not find in type material of *thomsonii* any marginal cystidia with long fine points, such as are seen in fresh material, but these are delicate and not likely to preserve well in dried material.

P. thomsonii is one of the more common British Plutei and varies much in cap size, and extent of venation; in larger specimens this is very marked indeed, in smaller ones it may be entirely absent. The agaric recorded as *P. godeyi* by Pearson (these *Trans.* **29** (1946), 196) and *P. godeyi* s. Kühn. & Romagn. are unveined specimens of *P. thomsonii*. In *BSMF*, **72** (1956), 203, Kühner created *P. cinereus* f. *evenosus* for such specimens, but I do not regard these as worth taxonomic separation. *P. godeyi* s. J. Lange I believe to be a different species (p. 355). This description of *P. thomsonii* is based on a number of collections made by me in different parts of Britain:

Cap 8–51 mm., convex then expanded, often slightly umbonate, sometimes slightly depressed when old, blackish brown or dark vandyke when young then sepia, umber or vandyke often with paler margin, *hygrophanous*, drying greyish sometimes with slight olive tinge, and often persistently darker sepia at the centre, *frequently strongly rugulose or reticulate-veined* at least in central part, sometimes quite smooth and with pruinose bloom (especially smaller specimens, Figs. 180–182), *pellucid-striate at* *margin when moist. Gills* free, often remote, ventricose, white then whitish or tinged brownish finally pinkish, subcrowded, L 24–44(56) l (0) 1–3, edge very minutely flocculose or denticulate under lens when fresh. *Stem* 20–50/1–4 mm., equal but often slightly thickened at base or apex, *grey or tinged olive to pale sepia, entirely white floccose-pruinose at first later silky striate* but apex usually persistently pruinose, solid or hollow, rather firm at first. *Flesh* in cap concolorous or sepia, grey or olive-grey in stem cortex, drying white in centre of cap and stem. *Smell* none. *Spores* subglobose or broadly ellipsoid, 6–8/5–7 μ. *Marginal cystidia* clavate or fusiform, 30–60/8–20 μ, *some with long fine hair-like appendages 20–50 μ long*, sometimes a few others with shorter pointed appendages (Fig. 486). *Facial cystidia absent.* Cap cuticle *mixed*, of (1) fusiform or rather pointed clavate cells, *ca.* 50–80/10–22 μ projecting beyond (2) shorter clavate or pyriform cells 10–40 μ diam.

On fallen deciduous twigs and logs, sometimes apparently on the ground (probably on buried wood), rather common: Juniper Hill, Mickleham, Surrey, 14 Nov. 1954, 4 Oct. 1955, and subsequently; Middle Marsh, Wheatfen, Surlingham, Norfolk, 20 July 1956; Bindon Landslip, Rousdon, Devon, 29 Nov. 1958, and elsewhere.

Pluteus xanthophaeus sp.nov. (Fig. 474)

Pileus 16–48 mm., e convexo expansus, interdum obtuse umbonatus, ad discum umbrinus vel fuscus marginem versus graduatim magis flavo- vel citrino-tinctus, interdum circa discum olivaceo-brunneus leviter vel -viridulus, senectute luteolo-mellinus vel ochraceo-brunneus, jove pluvio striatus, ad discum vel fere totus eleganter vel aliquantum crasse reticulato-venulosus interdum punctato-rugulosus, senectute interdum ad marginem sulcato-striatus. Lamellae liberae, vulgo remotae, ventricosae, ex albo vel albido cremeo-ochraceae vel flavo- vel citrino-tinctae dein cremeo-incarnatae vel obscuriore incarnatae, subconfertae, L 30–40 l 0–3, ad aciem albo vel pallidiore flocculosae. Stipes 25–60/2–8 mm., aequalis vel ad basim leviter incrassatus, ex albo albidus et ad basim citrinotinctus, interdum totus pallide hyalino-luteolus, eleganter albosericeo striatus, ad apicem leviter albopruinosus, dein glabrescens, solidus, primo firmus, ad basim albostrigoso-tomentosus. Caro pilei colore cornus tincta, sordide luteola vel olivaceo-brunnea, siccitate pallidiore, stipitis albida dein ad basim vel rariore totus luteolotincta. Odor nullus vel debilis, acidulosus. Sporae subglobosae, 5½–8/5–6 μ. Cystidia aciei lamellarum clavata, fusiformia (interdum ad apicem aliquantum acuta) vel lageniformia, 28–75/10–24(28) μ. Cystidia faciei lamellarum lageniformia vel fusiforme-lageniformia, 40–84/14–30 μ ad apicem 4–12(14) μ lata (Fig. 474), vulgo luteolo-vacuolata. Cellulae cuticulae pilei (1) spheropedunculatae vel pyriformes 12–48 μ latae, brunneo-vacuolatae sed ad marginem extremam hyalinae, (2) infra eas cellulae fere cylindricae flavo-vacuolatae.

Ad ramulos, ad lignum vel ad scobem. Whitlands Landslip, Rousdon, Devon, 18 July 1959 (typus in Herb. Kew.). P. galeroides et P. luteovirens maxime affinis sunt, sed P. galeroides a coloribus flavis distinctioribus et lamellis vulgo ochraceotinctis, P. luteovirens a coloribus flavis solum ad pileum (qui leviter viride tinctus est) differunt.

Cap 16–48 mm., convex then expanded, sometimes obtusely umbonate, *vandyke or sepia at centre gradually shading to brighter lemon-yellow at margin*, sometimes olive-brownish or slightly olive-greenish round centre, when old yellowish honey or ochraceous-brownish, *striate* at margin when moist, finely to rather coarsely reticulate-veined at centre or almost to edge, sometimes punctate-rugulose, when old often sulcate-striate at margin. *Gills* free, often remote, ventricose, *white or whitish then often tinged creamy* *ochraceous or chrome- or lemon-yellow*, finally pinkish creamy or deeper pinkish, subcrowded, L 30–40 l 0–3, edge white or whitish flocculose. *Stem* 25–60/2–8 mm., equal or slightly swollen at base, *white then whitish and tinged lemon-yellow at base*, sometimes entirely faintly hyaline-yellowish, *finely white silky striate*, apex slightly white pruinose then ± smooth, solid, firm at first, base white strigose-tomentose. *Flesh of cap horny or yellowish horny to olive-brownish*, *of stem whitish* then tinged yellowish at base or more rarely all through. *Smell* none or faint, acidulous. *Spores* subglobose, $5\frac{1}{2}$–8/5–6 μ. *Marginal cystidia* clavate, *fusiform* (*sometimes with rather pointed apex*) *or lageniform*, 28–75/10–24(28) μ. *Facial cystidia* lageniform or fusiform-lageniform usually with rather narrow apex, 40–84/14–30 μ, apex 4–12(14) μ (Fig. 474), often with lemon-yellowish contents. Cells of cap cuticle (1) spheropedunculate or pyriform, 12–48 μ diam., *with brownish contents* except for those at extreme margin which have colourless contents, and (2) below these *narrow ± cylindric cells with yellow vacuolar pigment.*

On twigs, logs and sawdust, not uncommon, often solitary: Bindon Landslip, Rousdon, 29 Nov. 1958 and 2 Dec. 1958; Whitlands Landslip, Rousdon, Devon, 18 July 1959 (type in Herb. Kew); Mountain Wood, East Horsley, Surrey, 6 Nov. 1953; Chatsworth Park, Derbys. (on sawdust), 11 Sept. 1956.

This is *P. chrysophaeus* s. J. Lange but not *Agaricus* (Pluteus) *chrysophaeus* Fr., 1838, which I take to be a synonym of *A.* (P.) *phlebophorus* Dittm. ex Fr., 1821 (has priority), and which differs in the more consistently strongly veined cap, not or scarcely striate when moist, no bright yellow colours anywhere and perhaps stronger acidulous smell. Very similar to *P. galeroides* and *P. luteovirens*, but the former differs in being more markedly chrome yellow and the latter in the restriction of yellow to the cap which is often more greenish yellow. It remains to be seen if these three microscopically rather similar species are really distinct. *P. lutescens* has much broader, differently shaped facial cystidia and deeper chrome yellow stem.

PSATHYRELLA

Much work remains to be done on this rather large and difficult genus. I have not yet sufficient data to attempt more than descriptions of some of my more outstanding collections, mostly species with a well-marked veil; the sorting out of those without a distinct veil or only a slight veil must await more field work; since exact details of marginal and facial cystidia are frequently missing in descriptions made by previous authors, this task is no easy one. I suspect that, as in *Pluteus*, facial cystidia will be found to be more consistent in shape and therefore taxonomically more important than the marginal. I have also examined type material of a number of Berkeley & Broome species which would be placed in *Psathyrella* at the present time, but in most I have limited myself to spore details since I have not been able to find cystidia sufficiently well preserved to describe.

Psathyrella badiovestita sp.nov. (Figs. 185–188, 357, 484)

Pileus 10–37 mm., e conico-convexo conico-expansus vel expansus late umbonatus, badius vel umbrinus, siccitate pallide ochraceus ad discum obscuriore coloratus interdum circa marginem incarnato-tinctus, jove pluvio striatus, jove sicco leviter rugulosus, primo ad partem externam squamulis fibrillosis dispersis ad marginem persistentioribus obtectus. Lamellae late adnatae interdum dente decurrentes, ex argillaceo-albido pallide argillaceo-fuscae dein argillaceo-umbrinae, subconfertae, L 18–24 l 3–7, ad aciem albido vel interdum incarnato flocculosae. Stipes 85–125/1–4 mm., aequalis vel ad basim leviter incrassatus, interdum flexuosus, albidus dein sursum pallide sordide brunneolus, ad apicem albo-pruinosus, infra e velo albo vel albido maculis dispersis obtectus, cavus, aliquantum fragilis, ad basim albo-strigoso-tomentosus. Caro tenuissima, pilei concolorata, stipitis albida. Odor nullus vel debilis. Sporae ellipsoideae poro germinativo 11–14/6–7(7½) μ (Fig. 357). Basidia 4-sporigera. Cystidia aciei lamellarum praecipue lageniformia ad apicem obtusa 40–58/7–10 μ ad apicem ca. 4–6 μ lata, paucis clavatis vel pyriformibus ca. 40/16 μ. Cystidia faciei lamellarum lageniformia vel anguste fusiformia 60–72/11–13 μ ad apicem ca. 5–7 μ lata (Fig. 484). Cuticula pilei cellularis; cellulae hypharum veli cylindrico-ellipsoideae 6–12(20) μ latae.

Ad viam in silvis, School Wood, Lucton, Herefordshire, 27 Oct. 1959 (typus in Herb. Kew.). Pileo jove pluvio badio vel umbrino e velo fibrilloso-squamuloso, sporis magnis cystidiis lageniformibus insignis. Psathyra semivestita sensu Ricken idem censeo, sed Agaricus (Psathyra) semivestita a sporis minoribus differt.

Cap 10–37 mm., conico-convex then expanded-conical or expanded broadly umbonate, *bay*, *date-brown or umber* drying pale ochraceous with darker centre, sometimes with pinkish tinge round margin, striate at margin when moist, sometimes slightly rugulose when dry, *at first with scattered white fibrils or fibrillose scales in outer part* these persisting at margin. *Gills* broadly adnate sometimes with slight tooth, *clay-whitish then pale clay-sepia* finally clay-umber, subcrowded, L 18–24 l 3–7, edge whitish or sometimes pinkish flocculose. *Stem* 85–125/1–4 mm., equal or slightly thickened at base, sometimes flexuose, whitish then pale dirty brownish from base up, apex white pruinose, *lower part with scattered white or whitish silky patches from veil*, hollow, rather fragile, base white strigose-tomentose. *Flesh* very thin, concolorous in cap, whitish in stem. *Smell* none or faint fungussy. *Spores* ellipsoid with germ pore, *11–14/6–7(7½) μ* (Fig. 357). *Basidia* 4-spored. *Marginal cystidia* mostly lageniform with fairly narrow obtuse apex, 40–58/7–10 μ, apex *ca.* 4–6 μ, with a few clavate or pyriform about 40/16 μ. *Facial cystidia lageniform or narrowly fusiform*, 60–72/11–13 μ, *apex ca. 5–7 μ* (Fig. 484). Cap cuticle cellular; cells of hyphae of veil cylindric-ellipsoid, *ca.* 40–60/6–12(20) μ.

On soil by path in woods: Bear Wood, Wokingham, Berks, 11 Oct. 1955; School Wood, Lucton, 27 Oct. 1959 (type in Herb. Kew). Recognized by bay or date-brown moist cap with conspicuous veil remnants at margin, large spores and lageniform cystidia. This is *Psathyra semivestita* s. Ricken but not *Agaricus* (Psathyra) *semivestitus* s. Berk. & Br. which has smaller and narrower spores 10–12/5½–6½ μ (Fig. 358).

PSATHYRELLA CHONDRODERMA (Berk. & Br.) A. H. Smith (Fig. 370)

Type specimens of *Agaricus* (Psilocybe) *chondrodermus* Berk. & Br., 1876, have ellipsoid or very slightly phaseoliform spores, 6–8/4–4½ μ, apiculus and germ pore hardly visible, rather pale sub micr. (Fig. 370). This is in agreement with spore details given by recent authors for this species, which is therefore included in the list s. J. Lange, Kühner & Romagnesi, etc.

PSATHYRELLA CLIVENSIS (Berk. & Br.) P. D. Orton (see p. 180 and Fig. 363)

Type specimens of *Agaricus* (Psilocybe) *clivensis* Berk. & Br., 1861, have rather broadly ellipsoid or ellipsoid-ovoid spores, rarely very slightly phaseoliform, 9–10(11)/5½–6½ μ, apiculus not or hardly visible, germ pore not readily visible, very pale sub micr. (Fig. 363*a*). This is in agreement with the spores (Fig. 363*b*) of a *Psathyrella* sp. found fairly frequently by me throughout the season on chalk grassland in Surrey, the macroscopic characters of which agree with the original diagnosis of *A. clivensis*; I have therefore included it in the 'List' as *Psathyrella clivensis* and give a description based on my notes:

Cap 12–30 mm., convex or conico-convex then expanded-convex sometimes slightly umbonate, *often broadly hemispherical for some time*, *amber or date-brown*, drying whitish, pale ochraceous or pale tan, often with darker centre, sometimes with darker marginal zone when half dry, *not or slightly striate* but rather smooth and shiny *when moist*, matt and ± atomate when dry sometimes cracking in places, margin at first with a few very fugacious white fibrils from veil. *Gills* adnate often with tooth, ± ventricose, *whitish or pale clay then pale clay-umber* or coffee colour, sometimes finally with slight violaceous tinge, subcrowded, L 20–32 l 3(7), edge white or whitish flocculose-denticulate. *Stem* 25–40/1½–3 mm., equal or slightly thickened at base, white or whitish then discolouring pale dirty brownish from base up, scattered white silky striate, apex white pruinose, hollow, base white tomentose. *Flesh* concolorous in cap drying whitish, hyaline-whitish in stem, often horny-date-brown over gills, sometimes rather thick at centre of cap. *Smell* none. *Spores* 9–11(12)/5½–6½(7) μ, *ellipsoid or ellipsoid-ovoid*, more rarely slightly phaseoliform (Fig. 363), *very pale sub micr.*, clay-umber in mass. *Basidia* 4-spored. *Marginal cystidia* clavate or pyriform 20–40/8–18 μ. *Facial cystidia rather obtusely lageniform or fusiform*, 36–60/10–16 μ, not very numerous. Cap cuticlecellular, cells 8–20 μ diam.; hyphae of veil traces filamentous, (3)5–12 μ diam., clamped.

In chalk grassland: Epsom Downs, Surrey, 17 Nov. 1951; Juniper Hill, Mickleham, Surrey, 22 May 1953, 23 June 1956. Readily distinguished by dull colours, pale spores and frequently hemispherical cap. Except for the non-striate cap margin of most of my specimens, these collections agree remarkably closely with the original diagnosis of *clivensis*.

Psathyrella cortinarioides sp.nov. (Figs. 189, 189*a*, 190, 359, 485)

Pileus 22–34 mm., e convexo expansus vel leviter depressus, interdum ad marginem undulato-lobatus, umbrinus, siccitate pallide sordide umbrinus dein nunc sordide luteolus nunc ochraceus ad discum obscuriore ochraceo-brunneus vel fulvotinctus, jove pluvio exstriatus sed juxta marginem radialiter obscuriore lineatus, e velo albido vel pallide sordide luteolo-brunneo squamulis adpressis interdum leviter recurvatis circa marginem ad partem internam magis dispersis obtectus. Lamellae adnatae interdum dente decurrentes, ± ventricosae, pallide argillaceo-umbrinae dein cacainae vel violaceo-umbrinae (colore lamellarum Agarici campestris), subconfertae L 24–32 l 3, ad aciem albo-flocculosae. Stipes 25–45/2½–5 mm., aequalis vel sursum attenuatus, ad basim interdum incrassatus, albus dein sursum sordide brunneolus vel pallide cacainus, ad apicem albo-pruinosus, infra e velo albo vel albido squamulis elongatis fibrilloso-floccosis fere totus obtectus, dein dubie annuloso-zonatus vel squamulis sparsis leviter recurvatis obtectus, cavus, ad basim albo-tomentosus. Caro pilei concolorata, stipitis in corticem alba intus ochracea vel pallide umbrina. Sporae ellipsoideo-phaseoliformes, 7–8½/4–5 μ (Fig. 359). Basidia 4-sporigera, 28–30/9–10 μ. Cystidia aciei lamellarum (1) vesiculosa, clavata vel pyriformia, 20–38/10–20 μ, (2) lageniformia cervice aliquantum longa et ad apicem obtusa, tenuitunicata, 30–50/10–14 μ ad apicem 4–8 μ lata. Cystidia faciei lamellarum lageniformia ad apicem obtusa 40–60/11–15 μ, ad apicem (4)6–8 μ, aliquantum tenuitunicata (Fig. 485). Cuticula pilei cellularis cellulae 24–48 μ latae; cellulae hypharum veli subcylindricae, hyalinae, 4–8(12) μ latae; cellulae fibulatae non visi.

Ad terram sub Quercubus, Surlingham Wood, Surlingham, Norfolk, 18 Oct. 1957 (typus in Herb. Kew.). A P. spintrigeroides proxime accedit, sed a cystidiis faciei lamellarum obtusis, habitatione et coloribus differt. P. xanthocystis et P. jerdonii a sporis majoribus differunt.

Cap 22–34 mm., convex then expanded or slightly depressed, sometimes with wavy-lobed margin, *date-brown-umber* drying pallid date or dirty yellowish or ochraceous with darker ochre-buff or slightly tawny-tinged centre, *not* pellucid-striate but radially darker streaky near margin when moist, *whitish or pale buff veil leaving adpressed scales round margin and scattered patches or slightly recurved scales round centre. Gills* adnate, sometimes with slight tooth, ± ventricose, *pale clay-umber then chocolate* or violaceous-umber (colour of gills of *Agaricus campestris*), subcrowded, L 24–32 l 3, edge white flocculose. *Stem* 25–45/2½–5 mm., equal or attenuated from thickened base, white then dirty brownish or pale chocolate from base up, apex white pruinose, remainder *with elongate fibrillose-floccose scales from white or whitish veil*, which sometimes leaves a vague ring-zone or a few recurved scales on lower part, hollow, base white tomentose. *Flesh* of cap concolorous, of stem cortex white, in centre of stem ochraceous, pale vandyke or pale umber. No *smell* noted. *Spores ellipsoid-phaseoliform, 7–8½/4–5 μ* (Fig. 359). *Basidia* 4-spored, 28–30/9–10 μ. *Marginal cystidia* (1) vesiculose, clavate or pyriform, 20–38/10–20 μ; (2) lageniform with rather long obtuse neck, thin-walled, 30–50/10–14 μ, apex 4–8 μ. *Facial cystidia lageniform with obtuse apex*, 40–60/11–15 μ, apex (4)6–8 μ, rather thin-walled (Fig. 485). Cap cuticle cellular, cells 24–48 μ diam.; hyphae of veil of subcylindric hyaline cells 4–8(12) μ diam.; no clamps seen.

On earth bank under oak: Surlingham Wood, Surlingham, 18 Oct. 1957 (type in Herb. Kew); Allerford Wood, Bossington, Som., 8 Nov. 1959. Somewhat resembling *P. spintrigeroides*, but with obtuse facial cystidia, a different habitat and appearance. The small spores separate it from *P. jerdonii* and *P. xanthocystis*. *P. spintrigera* has differently shaped marginal cystidia and no facial cystidia. I describe this as new as I cannot find it described in current literature.

AGARICUS (HYPHOLOMA) *EGENULUS* Berk. & Br., 1861 (Fig. 361)

Type specimens have ellipsoid or slightly phaseoliform spores with small apiculus and germ pore, 7–8½/4–5 μ, rather pale sub micr. (Fig. 361). These are similar to those of *P. candolleana* and in the absence of convincing macroscopical differences I regard *A.* (H.) *egenulus* as a synonym.

AGARICUS (PSATHYRELLA) *EMPYREUMATICUS* Berk. & Br., 1861 (Fig. 371)

Type specimens have ellipsoid spores with small apiculus and conspicuous germ pore, 14–16/8–10 μ, very dark brown sub micr. (Fig. 371). The cap cuticle is apparently cellular. In the absence of fresh material I prefer to exclude this species from the 'List' for the present; the very dark spores suggest a *Coprinus* sp., however. *Drosophila empyreumatica* s. Romagn. with spores 'remarquablement pâles sous le microscope, 8·5–10·2/5·2–6 μ' (1953, p. 363) is clearly another species of *Psathyrella*, probably new, rather resembling *P. clivensis* but with slightly smaller spores and brighter colours. This I believe I have seen on a lawn in the grounds of Epsom College, Surrey, but have no personal notes and cannot describe it.

Psathyrella flexispora T. J. Wallace & P. D. Orton sp.nov. (Figs. 191–194, 362, 487, 488)

Pileus 10–25 mm., e convexo haud expansus, interdum leviter conico-expansus vel obtuse umbonatus, cacainus vel umbrinus, siccitate sordide luteolus vel luteolo-brunneus, interdum ad discum, ochraceo- vel fulvo-tinctus, dum siccat circa marginem saepe zona obscuriore bicoloratus videtur, jove pluvio ad marginem striatus, jove sicco atomatus, ad marginem e velo albo copioso lacerato-appendiculato ornatus et interdum squamulis sparsis ad externam partem obtectus. Lamellae late adnatae interdum dente decurrentes, vulgo latae et fere planae interdum ventricosae, ex argillaceo-albido argillaceo-umbrinae dein nigro-umbrinae, subdistantes, L 14–20 l (1)3, ad aciem sub lente pallidiore vel albido flocculoso-denticulatae. Stipes 18–33/1–3 mm., aequalis vel ad basim leviter incrassatus, albidus dein sursum colore pilei tinctus, primo e velo albo squamulis fibrillosis obtectus dein glabrescens vel albo sericeo striatus, e farcto anguste cavus. Caro pilei sordide rufo-brunnea, siccitate ochracea vel albida, stipitis sordide luteolo- vel ochraceo-brunnea, vulgo ad apicem et ad basim umbrino vel cacaino tinctus. Sporae ellipsoideae ad extremum apiculatum curvatae, poro germinativo, 9–11/5–5½ μ (Fig. 362). Basidia 4-sporigera. Cystidia aciei lamellarum (1) clavata, pyriformia vel fusiformia, 22–40/9–20 μ, (2) lageniformia vel vesiculoso-clavata appendice breve angusta terminata, ad apicem obtusa vel aliquantum acuta, 30–44/10–12 μ ad apicem 1–2(4) μ (Fig. 487). Cystidia faciei lamellarum lageniformia cervice longa anguste tenuitunicata, 40–54/10–12 μ ad apicem 2–4 μ lata (Fig. 488). Cellulae cuticulae cellularis pilei 20–50 μ latae.

In sabulis maritimis inter Ammophilas, Carices arenarias et Festucas, Studland, Dorset, 25 Nov. 1951 (typus in Herb. Kew) et 29 Oct. 1952 (legit T. J. Wallace), 17 Nov. 1958. A P. gossypina maxime accedit, sed a sporis peculiaribus et habitatione facile distinguitur.

Cap 10–25 mm., convex, hardly expanding, sometimes slightly conico-convex or obtusely umbonate, *chocolate-umber or date-brown*, drying yellowish buff or dirty yellowish from centre, sometimes tinged ochraceous or tawny at centre, often bicoloured with darker marginal zone when drying, *striate* half-way when moist, opaque and atomate when dry, *margin at first with copious white lacerate-appendiculate veil* and sometimes also a few scales just inside margin. *Gills* broadly adnate, sometimes with slight tooth, often broad and almost plane, sometimes ventricose, *clay-whitish then clay-umber to blackish umber*, subdistant, L 14–20 l (1)3, edge under lens paler or whitish, minutely flocculose-denticulate. *Stem* 18–33/1–3 mm., equal or slightly swollen at base, whitish then tinged cap colour from base, apex more persistently paler, *at first with white fibrillose scales* *from veil but soon white silky striate* or almost smooth, stuffed then narrowly hollow. *Flesh* of cap pallid reddish brown drying ochraceous or whitish, of stem dirty buff or ochraceous-date-brown, often tinged umber or chocolate at apex base. No *smell* noted. *Spores ellipsoid*, curved at the apiculate end, with germ pore, *9–11/5–5½ μ* (Fig. 362), blackish brown ('Dusky Drab') in mass. *Basidia* 4-spored. *Marginal cystidia* (1) clavate, pyriform or fusiform 22–40/9–20 μ; (2) lageniform or vesiculose-clavate with short narrow appendage, apex obtuse or rather acute, 30–44/10–12 μ, apex 1–2(4) μ (Fig. 487). *Facial cystidia lageniform, with rather long narrow neck*, thin-walled, 40–54/10–12 μ, *apex 2–4 μ* (Fig. 488). Cap cuticle cellular, cells 20–50 μ diam.

In sand dunes (mostly behind the fore dunes) amongst *Ammophila*, *Carex arenaria* and *Festuca*, Studland, Dorset, 25 Nov. 1951 (type in Herb. Kew) and 29 Oct. 1952 (legit T. J. Wallace), 17 Nov. 1958. Macroscopically rather similar to *P. gossypina* but easily distinguished by peculiar shape of spores and habitat.

PSATHYRELLA GORDONII (Berk. & Br.) Pearson & Dennis (Figs. 195, 367, 491)

Type specimens of *Agaricus* (Psathyra) *gordonii* Berk. & Br., 1861, have spores (9)10–11/5–6¼ μ, ellipsoid or ellipsoid slightly amygdaliform with a well-marked germ pore and fairly conspicuous apiculus, rather dark brown sub micr. (Fig. 367*a*). Since the original diagnosis gives 'densely caespitose on old stumps', the epithet *gordonii* should not be used for terrestrial species. Neither of the two agarics described by J. Lange as *Psathyra gordonii* f. *minor* and *P. gordonii* var. can be referred to this epithet (for comments on these see 'List', Part II), since they are terrestrial and are not stated to be or figured as caespitose. I have, however, collected a pale caespitose agaric with similar spores from beech stumps and agreeing for the most part with the original diagnosis of *gordonii*. I have therefore included *Psathyrella gordonii* in the 'List' and give a description of the collection I consider to be of this species:

Cap 20–45 mm., convex or slightly umbonate, soon expanded umbonate, *livid grey or horn colour often tinged sepia or date-brown at the centre*, drying whitish with pale ochraceous or dirty brownish centre, striate at margin when moist, matt or with slight silky sheen when dry, at first *entirely scattered white silky fibrillose with copious appendiculate veil*, *later with smooth centre and rather thick white dentate scales or patches at or near margin. Gills* adnate, often rather narrow lanceolate, not or slightly ventricose, *greyish or with slight violaceous tinge*, finally pallid umber, rather crowded, L 34–60 l 3–7, edge white flocculose. *Stem* 35–70(110)/2–6(8) mm., attenuated upwards, flexuose, *pure white* then discolouring pale dirty brownish below, apex white pruinose-floccose, remainder *white floccose-scaly from veil, flocci larger and denser towards base* and sometimes leaving ring-like traces about half-way down, later smoother and silky striate, hollow, fragile, base white tomentose. *Flesh* concolorous in cap, horny over gills, white in stem, discolouring pale dirty ochraceous in lower stem. *Smell* none or faint pleasant. *Spores ellipsoid or ellipsoid slightly amygdaliform* with well-marked germ pore and moderate apiculus, rather dark brown sub micr., *9–11(12)/5–6(6½)* μ (Fig. 367*b*, *c*), violaceous-umber in mass. *Basidia* 4-spored. *Marginal cystidia* obtusely lageniform to *almost utriform*, (24)30–48(60)/10–15 μ, apex 4–8 μ (Fig. 491). *Facial cystidia absent.* Cap cuticle cellular; cells of hyphae of veil on cap subcylindrical, 5–15 μ diam., sometimes clamped.

Densely caespitose (Fig. 195) or gregarious on stumps: Burnham Beeches, Bucks, 23 Oct. 1955 (on beech); also recorded by A. A. Pearson (in litt.) on elm stump, Bicester, Oxon., 4 Oct. 1949.

Recognized by lignicolous habitat, caespitose habit, absence of facial cystidia, pale colours, conspicuous veil and rather large spores. *P. leucotephra* is more robust, has relatively broader spores 8–10/5½–6½ μ (Fig. 366) and the veil on the stem restricted to an apical ring-zone. *P. jerdonii* apparently grows on coniferous wood and has rather longer and narrower spores of a different shape. The original diagnosis of *gordonii* states the cap to be sulcate-striate, the gills distant and the smell 'faint, nauseous' but these differences from my collection do not seem to me sufficiently marked to warrant rejection of the epithet *gordonii* for this.

PSATHYRELLA HYDROPHILA (Bull. ex Fr.) R. Maire (with discussion of *Agaricus appendiculatus* Bull. ex St Amans and *A. piluliformis* Bull. ex Mérat)

The first valid use of this epithet was by Fries in *Syst. Mycol.* 1 (1821), 296, as *Agaricus* (Pratella) *stipatus* β *A. hydrophilus* Bull. ex Fr. and is described there 'major, pileo 3–5 unc., lamellis ad dimidium adfixis lineatim decurrentibus fusco-umbrinis, stipite valido (6 poll. altus, ½ unc. crassus) rigido. Circa Fraxini truncos in Scania', and Bulliard Pl. 511 (erroneously given as 512) is amongst the plates quoted for *A. stipatus*. Most of the fruit bodies shown on this plate are robust, some with traces of veil at the cap edge, but there is no evidence that they are growing on wood. Neither the descriptions of Fries or Mérat nor the Bulliard plate mention or show weeping gills and it is not until 1838 that Fries (*Epicrisis*, p. 225) inserts the word 'plorantibus' into his description of the gills of *A. hydrophilus*. Even so I suspect that *hydrophilus* may sometimes show this character since the cells on the gill edge are often obtuse. In any case the description in *Epicrisis* is not the earliest description so that it need not be accepted as having taxonomic bearing on this question. The identity of *A. stipatus* Pers. ex Fr., 1821, is not certain and it probably includes several species of *Psathyrella* judging by the description and plates quoted and must be rejected as a nomen confusum. It seems reasonable therefore to retain the epithet *hydrophilus* for the agaric well known under this epithet.

Kühner & Romagnesi (1953, p. 365) use the epithet *appendiculata* for this species. *Agaricus appendiculatus*, however, was not taken up by Fries but by St Amans in 1821 and is described as having the cap 'semi-orbiculaire muni en ses bords d'appendices membraneuses, fragile, bistre' and the gills 'd'un rose tendre', the habitat being given as 'après de longues pluies dans les bois'. The Bulliard plate (392), quoted by St Amans, shows fruit bodies resembling *A. candolleanus* more than *A. hydrophilus* (especially the lower group) and there is no indication that it was growing on wood. It does not seem appropriate therefore to use this epithet instead of *hydrophilus*. (Ricken, it may be noted, has described yet another agaric as *Hypholoma appendiculata*.)

Agaricus piluliformis Bull. ex Mérat, 1821, is described in the validating description as having the cap 6–8 lines diam. and the stem twice as long, the specimens figured in the quoted Bulliard plate (112) all being small with non-expanded caps. For this reason it is sometimes stated that these are young specimens of *A. hydrophilus* or *A. candolleanus*. Fries also stresses the small size (e.g. in *Monographia*, p. 428, 'est quasi forma diminuta *A. appendiculati*') so that the use of this epithet for an agaric with more robust fruit bodies, as done by Kühner & Romagnesi ('var. *pilulaeformis* s. Ricken', p. 365) does not seem advisable, especially as Ricken does not use the epithet himself but only mentions it in his notes on *Hypholoma hydrophila* as 'Die kurzgestielte fast kugelige Form (vielleicht *pilulaeformis*—Bull.)'! However, my experience in the field leads me to believe that there is a small '*hydrophilus*' corresponding to *A. piluliformis* Bull. and perhaps to *appendiculata* s. Kühn. & Romagn. as well as a more robust and more common '*hydrophilus*' (perhaps corresponding to var. *pilulaeformis* s. Kühn. & Romagn.), but I am not yet prepared to state whether these are in fact two species. I suspect this to be so and that the smaller one grows gregariously in large numbers (like *Coprinus disseminatus* and as shown in the Bulliard plate of *A. piluliformis*), whereas the larger one is densely caespitose; there may also be differences in cap colour and facial cystidia. If these are distinct then the epithet *hydrophilus* should be retained for the larger.

PSATHYRELLA JERDONII (Berk. & Br.) Konrad & Maublanc (p. 368)

Type material of *Agaricus* (Stropharia) *jerdonii* Berk. & Br., 1861, has elongate ellipsoid or ellipsoid-ovoid spores with prominent apiculus but germ pore barely visible, 10–11½/5–5½ μ (Fig. 368). The cap cuticle is cellular. Facial cystidia are apparently absent (I would not say definitely so without examining fresh material), but some rather obtuse ± lageniform, probably marginal cystidia were seen. A comparison of the drawings of the spores from the type material and those given by J. Lange for his *Stropharia jerdonii* shows that they are of similar shape and size and I regard J. Lange's interpretation of *jerdonii* as correct and have therefore included *Psathyrella jerdonii* s. J. Lange in the 'List', though I have not collected it myself nor seen fresh material. I have not been able to find a description giving full details of marginal and facial cystidia (if present), exact details of which are required. *Drosophila jerdonii* s. Kühn. & Romagn. (1953, p. 359) with smaller spores and numerous and obvious rather thick-walled acute marginal and facial cystidia is plainly different and I have described it as a new species, *P. xanthocystis*. There are thus at least three species of *Psathyrella* with obvious white veil often growing on coniferous wood—*P. chondroderma* with small spores 6–8/4–4½ μ (Fig. 370) and no facial cystidia, *P. xanthocystis* with spores 7½–9/4¾–5½ μ (Fig. 369) and numerous facial cystidia and *P. jerdonii* with spores 10–11½/5–5½ μ (Fig. 368), probably without facial cystidia, as well as *P. caput-medusae* with coloured veil scales on the cap.

PSATHYRELLA LEUCOTEPHRA (Berk. & Br.) P. D. Orton (see p. 180 and Figs. 366, 490)

Type material of *Agaricus* (Hypholoma) *leucotephrus* Berk. & Br., 1870, has spores 8½–10/5½–6½(7) μ, rather broadly ellipsoid or slightly phaseoliform or lenticular, with apiculus and germ pore barely visible (Fig. 366*a*) and fairly dark sub micr. This is in close agreement with the shape and dimensions given by Kühner & Romagnesi (1953, p. 367) for their *Drosophila leucotephra* and with *Stropharia hypsipus* as described by J. Lange, and I have included *P. leucotephra* in the 'List' in this sense. The epithet *hypsipus* is not applicable to this caespitose lignicolous agaric since *Agaricus* (Stropharia) *hypsipus* is described by Fries as 'in turfosis solitarius'. Here is a description of *P. leucotephra* from British material:

Cap 30–67 mm., convex or conico-convex then expanded-conical or expanded broadly umbonate sometimes truncate-umbonate, *pale ochre-buff then sepia-horn* when moist, drying pale dirty buff, sometimes with darker marginal zone when drying, margin *not or slightly striate when moist, smooth except for adpressed white scales at margin from veil,* which may be appendiculate or just inside margin. *Gills* adnate, sometimes with slight tooth, ± ventricose, *dirty whitish or pale sepia without or with very slight violaceous tinge*, then darker sepia or with slight olive tinge, rather crowded, edge white flocculose-denticulate. *Stem* 60–140/5–9 mm., ± equal, *pure white* scarcely discolouring, apex striate from gills down to *spreading thin white apical ring, which soon becomes torn and adpressed to stem, remainder almost smooth* but with a few scattered white silky fibrils in places, hollow, fragile. *Flesh* dirty ochraceous-whitish in cap, slightly horny over gills and under cap cuticle, white in stem and sharply marked off from that of cap. *Smell* none. *Spores broadly ellipsoid or slightly phaseoliform or lenticular 8–10/5½–6½/5½–6 μ* (Fig. 366*b*), apiculus and germ pore not or barely visible under $\frac{1}{12}$th sub. immers., rather dark reddish brown sub micr. *Basidia* 4-spored. *Marginal cystidia utriform* or utriform-lageniform, a few fusiform-lageniform, 32–52/8–14 μ, apex 6–8 μ (Fig. 490). *Facial cystidia none.* Cells of cellular cap cuticle 10–36 μ diam.; cells of veil interwoven filamentous, branched clamped, 3–10 μ diam.

Caespitose at base of living ash, Gomshall, Surrey, 23 Aug. 1958. Also seen elsewhere on other deciduous trees. Readily distinguished by robust caespitose habit, lignicolous habitat, rather broad spores and absence of facial cystidia.

Psathyrella microlepidota sp.nov. (Figs. 196–198, 360, 489)

Pileus 10–70 mm., e convexo expanso-convexus, interdum senectute fere planus, primo ochraceo-luteolo-brunneus vel ad discum fulvotinctus et ad marginem fere albidus, dein sordide umbrinus interdum ad marginem griseotinctus vel ad discum umbrinus, siccitate pallide ochraceus vel cremeus ad discum obscuriore coloratus, jove pluvio striatus vel sulcato-striatus, e velo albo appendiculato primo ad marginem squamulis distinctis pannosis ornatus et squamulis parvis adpressis vel flocculosis dispersis totus vel praecipue circa discum obtectus dein glabrescens. Lamellae adnatae, lineares vel ventricosae, ex albido argillaceae vel pallide sordide argillaceo-violaceae dein obscuriore argillaceo-umbrinae vel violaceo-tinctae postremo nigro-umbrinae, confertae, L 26–44 l 3–7, ad aciem integrae vel albo-flocculosae. Stipes 30–65/1–4 mm. (ad basim < 7 mm. latus), sursum attenuatus vel aequalis vulgo ad basim incrassatus vel leviter bulbosus, albus dein interdum sursum sordide cremeus, primo exceptione ad apicem squamulis albis floccoso-fibrillosis totus dein dispersiore obtectus dein senectute glabrescens, ad apicem albo-pruinosus dein sericeo-striatus vel glabrescens interdum ad basim lamellarum distincte striatus, cavus, ad basim albo-tomentosus. Caro pilei concolorata siccitate albida vel sordide cremea, stipitis alba vel intus leviter cremea vel colore cornus tincta. Odor nullus vel debilis gratus. Sporae ellipsoideae vel leviter phaseoliformes, 5½–7½(8)/3½–4½ μ (Fig. 360). Basidia 4-sporigera. Cystidia aciei lamellarum utriformia 32–60/8–12 μ, rariore clavata vel cylindrico-clavata, < 18 μ lata, tenuitunicata (Fig. 489). Cystidia faciei lamellarum nulla. Cuticula pilei cellularis, cellulae 18–40 μ latae; cellulae hypharum veli fere cylindricae, ramosae, interdum ad septa leviter strangulatae et fibulatae, 4–12(18) μ latae.

Ad ramulos et ad ligna (Alni, Ulmi) et inter folias deciduas. Ad alni, Thack Marsh, Surlingham, Norfolk, 24 July 1957 (typus in Herb. Kew.). A P. candolleana pileo fere totus squamuloso, coloribus pilei obscurioribus, lamellis minus violaceo-tinctis, a P. spintrigera coloribus pallidioribus, pileo fere totus squamuloso, sporis leviter angustioribus differt.

Cap 10–70 mm., convex then expanded-convex, sometimes almost plane when old, *at first ochraceous-buff* or with slight tawny tinge at centre and paler almost whitish at margin, *then pallid date-brown sometimes with greyish margin or darker umber centre*, drying pale ochraceous or creamy with darker centre, when moist striate at margin in larger specimens sulcate-striate, *white veil appendiculate at first and forming conspicuous ragged scales at margin and scattered rather small adpressed or flocculose scales all over cap especially round centre*, then becoming smooth. *Gills* adnate, linear or ventricose, *whitish then clay or pale dirty clay-violaceous*, then deeper clay-umber or pallid date-brown tinged violaceous, finally blackish umber, crowded, L 26–44 l 3–7, edge even or white or paler flocculose. *Stem* 30–65/1–4 mm. (< 7 mm. at base), attenuated upwards or equal, often with thickened or slightly bulbous base, *white* sometimes discolouring pale dirty cream from the base, *at first entirely white floccose-fibrillose scaly except at apex*, then scattered white fibrillose scaly to almost smooth, apex white pruinose then silky striate or almost smooth, sometimes markedly striate from base of gills, hollow, base white tomentose. *Flesh* of cap concolorous, drying whitish or dirty cream, of stem white or with slight creamy or horny tinge in centre. *Smell* none or faint pleasant. *Spores ellipsoid or slightly phaseoliform, 5½–7½(8)/3½–4½ μ* (Fig. 360). *Basidia* 4-spored. *Marginal cystidia utriform*, 32–60/8–12 μ, more rarely clavate or cylindric-clavate and < 18 μ diam., thin-walled (Fig. 489). *Facial cystidia absent.* Cells of cellular cap cuticle 18–40 μ diam.; cells of hyphae of veil, subcylindric, branched, slightly constricted at sometimes clamped septa, 4–12(18) μ diam.

On logs and twigs (alder, elm), also in leaf-mould: Thack Marsh, Surlingham, 24 July 1957 (on alder, type in Herb. Kew); Parish Marsh, Surlingham, 8 July 1958 (on leaf mould); Mousewood Farm Wood, Honingham, Norfolk, 10 July 1958 (on poplar). Differs from *P. candolleana* in the darker cap entirely scaly at first, less distinctly violaceous gills and habitat often on wood. *P. spintrigera* is deeper coloured, has the veil at the cap edge only and slightly broader spores.

PSATHYRELLA SEMIVESTITA (Berk. & Br.) A. H. Smith (Fig. 358)

Type material of *Agaricus* (Psathyra) *semivestita* Berk. & Br., 1861, has ellipsoid spores with fairly well-marked germ pore and apiculus, 10–12/5½–6½ μ (Fig. 358). The size corresponds closely to that given by A. H. Smith for his collection described under this name and the species is included in the 'List' in this sense, though I have not collected it myself in recent years. *P. semivestita* s. Ricken with spores 11–14/6–7(7½) μ (Fig. 357) I have described above as *P. badiovestita.*

Psathyrella spintrigeroides sp.nov. (Figs. 199, 365, 494)

Pileus 20–50 mm., e convexo vel conico-convexo expansus, interdum obtuse umbonatus, badius vel obscure umbrinus, siccitate ochraceus vel pallide sordide luteolobrunneus, interdum praecipue ad discum leviter fulvotinctus, jove pluvio exstriatus vel solum ad marginem striatus, e velo albo copioso appendiculato squamis dentatis aliquantum crassis interdum infra striatis ad marginem decoratus et ad externam partem fibrillis albis vel squamulis adpressis fibrillosis adspersus. Lamellae adnatae interdum dente decurrentes, ± ventricosae, e griseo-argillaceo vel pallide argillaceo-brunneo pallide argillaceo-umbrinae vel pallide purpureo-brunneae dein umbrinae, subconfertae, L 30–36 l 1–7, ad aciem juventute sub lente albo-flocculosae. Stipes 25–60/(3)4–7 mm., ± aequalis interdum flexuosus, pure albus dein mox sursum pallide sordido- vel luteolobrunneo decolorans, ad apicem a lamellis forte striatus et albo-pruinosus vel pubescens, infra e velo totus striato-floccosus vel fibrilloso-squamulosus interdum fugace annulosozonatus, cavus, primo aliquantum firmus. Caro concolorata, siccitate intus sordide luteola vel albida, interdum juxta lamellas vel ad apicem stipitis fuscotincta. Odor debilis, gratus. Sporae ellipsoideae leviter phaseoliformes, 7–9/4–5 μ (Fig. 365). Basidia 4-sporigera, 20–25/7–8 μ. Cystidia aciei lamellarum (1) clavata, pyriformia vel fusiformia tenuitunicata 10–14(24) μ lata, (2) lageniformia vel conico-lageniformia leviter crassotunicata 50–70/8–12(14) μ ad apicem 3–6 μ lata. Cystidia faciei lamellarum conico- vel fusiforme-lageniformia, vulgo ad apicem aliquantum acuta, aliquantum crassotunicata (tunicis in NH_4OH vel KOH lutescentibus) 60–84/8–12(16) μ ad apicem 2–6 μ lata (Fig. 494). Cellulae cuticulae pilei ca. 20–40 μ latae; cellulae hypharum veli ellipsoideo-cylindricae vel vesiculosae, ad septa strangulatae, interdum ramosae, 8–20(40) μ latae, hyphis angustioribus, subcylindricis, 2–8 μ latis mixtae.

Ad ramulos, ad ligna Fagi vel inter folias deciduas Fagi. Mountain Wood, East Horsley, Surrey, 5 Nov. 1955 (typus in Herb. Kew.). A P. xanthocystide sporis angustioribus, cystidiis minus crassotunicatis, habitatione, a P. jerdonii sporis minoribus differt. P. spintrigera ab absentia cystidiis faciei lamellarum distinguitur.

Cap 20–50 mm., convex or conico-convex then expanded, sometimes obtusely umbonate, *bay or deep date-brown*, drying ochraceous or pale buff sometimes with slight tawny tinge especially at centre, *not striate, or striate at margin only when moist, copious white appendiculate veil forming rather thick dentate scales at margin*, which are sometimes striate beneath, and also scattered white fibrils or adpressed fibrillose scales on outer part. *Gills* adnate, sometimes with tooth, ± ventricose, *greyish clay or pale clay-brownish then pale clay-umber or* pale purplish brown finally umber, subcrowded, L 30–36 l 1–7, edge white flocculose under lens when fresh. *Stem* 25–60/(3)4–7 mm., ± equal, sometimes flexuose, *pure white at first soon discoloured pale dirty brownish or yellowish brown from base*, apex markedly striate from base of gills and white pruinose or pubescent, *remainder entirely white striate-floccose or fibrillose-scaly from veil*, which sometimes forms a fugacious ring-zone, hollow, rather firm at first. *Flesh* concolorous, drying dirty yellowish or whitish in centre, sometimes sepia-horny over gills or in stem apex.

Smell faint pleasant, fungussy. *Spores ellipsoid slightly phaseoliform, 7–9/4–5 μ* (Fig. 365), fairly dark brownish sub micr. *Basidia* 4-spored, 20–25/7–8 μ. *Marginal cystidia* (1) clavate, pyriform or fusiform 10–14(24) μ diam., thin-walled, (2) lageniform or conico-lageniform 50–70/8–12(14) μ, apex 3–6 μ, slightly thick-walled. *Facial cystidia conico- or fusiform-lageniform mostly rather pointed at apex, walls fairly thick, yellowish in* NH_4OH *or* KOH, 60–84/8–12(16) μ, apex 2–6 μ (Fig. 494). Similar cells at apex of stem 40–80/10–14 μ. Cells of cellular cap cuticle *ca.* 20–40 μ diam.; cells of hyphae of veil ellipsoid to vesiculose, constricted at septa, sometimes branched, 8–20(40) μ diam., mixed with narrower interwoven filamentous hyphae 2–8 μ diam.

On beech twigs and logs and in beech leaves: Mountain Wood, East Horsley, 12 Oct. 1953, 5 Nov. 1955 (type in Herb. Kew); White Down, Abinger Hammer, Surrey, 29 Nov. 1953. Differs from *P. xanthocystis* in narrower spores, rather thinner-walled cystidia and habitat and from *P. jerdonii* in smaller spores. In view of the spore size given by J. Lange (8–9½/4½–5 μ) I think this is *Stropharia spintrigera* var. *semivestita* J. Lange (L 143 B), but *P. spintrigera* s. J. Lange, Kühn. & Romagn. differs in smaller spores (6–7½/4¾ μ sec J. Lange, L 143 A), no facial cystidia sec Kühn. & Romagn. and utriform marginal cystidia. It would seem that microscopic examination is essential for the determination of these veiled species of *Psathyrella* with special reference to spore size and presence or absence of facial cystidia.

Psathyrella vinosofulva sp.nov. (Figs. 364, 498, 499)

Pileus 15–23 mm., e conico-convexo conico-expansus vel expanso-convexus leviter umbonatus, obscure cacainus vel vinaceo-badius, siccitate mox fulvo-ochraceus vulgo praecipue circa discum clare fulvo- vel miniato-tinctus, postremo totus rufo-vinaceus, jove pluvio striatus, primo ad marginem residuis veli albidis fugacibus obtectus dein glabrescens. Lamellae adnatae, ± ventricosae, e pallide argillaceo argillaceo-fuscae vel -umbrinae, subdistantes, L 16–18 l 3(7), ad aciem conspicue albo- vel albido-flocculoso-denticulatae. Stipes 46–62/1½–2 mm., aequalis vel ad basim leviter incrassatus, vulgo flexuosus, pallide sordide luteolo-brunneus vel ochraceus, interdum ad basim vinaceo- vel umbrino-tinctus, supra albo-floccoso-pruinatus, infra minute albo-sericeo-striatus, interdum residuis veli fugacis adspersus, e farcto cavus, ad basim albo-tomentosus non radicans. Caro pilei concolorata, siccitate fulvo-ochracea vel pallide miniata, stipitis pallide sordide brunneola vel ochracea, interdum ad apicem vel ad basim extremam vinaceo-fusco vel umbrino tincta. Odor nullus. Sporae ellipsoideae poro germinativo, 11–13½/5¾–7 μ (Fig. 364), rufo-brunneae sub micr., in cumulo fere nigrae. Basidia 4-sporigera, 16–19/9–11 μ. Cystidia aciei lamellarum (1) nunc fere acute lageniformia nunc utriformia, tenuitunicata, 28–62/10–16(21) μ, (2) clavata vel pyriformia 16–33/9–24 μ (Fig. 498). Cystidia faciei lamellarum plerumque ± utriformia rariore lageniformia, tenuitunicata, 44–67/14–18 μ ad apicem 8–15 μ lata (Fig. 499). Cellulae cuticulae pilei 20–42 μ latae, infra eas hyphae filamentosae interdum aurantiaco-ochraceo incrustato-pigmentatae sunt.

Ad terram in silvo Fraxini, Dowland Landslip, Rousdon, Devon, 29 Nov. 1958 (typus in Herb. Kew.). A coloribus vinaceis P. bipelle similis, sed a pileo fere glabro, cystidiis minoribus, coloribus pilei clarioribus, lamellarum non vinaceis, statura graciliore differt.

Cap 15–23 mm., conico-convex then conico-expanded or expanded-convex, slightly umbonate, *deep chocolate or vinous-bay*, soon drying tawny ochraceous from centre, *then often with bright tawny or vermilion tinge especially* *round centre*, *entirely wine-reddish when quite dry*, striate when moist, at first with faint traces of whitish fugacious veil at margin. *Gills* adnate, ventricose, *pale clay then clay-sepia to clay-umber*, not crowded, L 16–18 l 3(7), edge conspicuously white or whitish flocculose-denticulate. *Stem* 46–62/1½–2 mm., equal or slightly thickened at base, often flexuose, *pale dirty buff or pale ochraceous*, *sometimes vinous or umber at base*, white floccose-pruinose at apex, minutely white silky-striate in lower part and sometimes with a few fugacious traces of white veil, stuffed then hollow, base white tomentose, not rooting. *Flesh* of cap concolorous *drying ochraceous-tawny or pale vermilion*, of stem pale buff or pale dirty ochraceous, sometimes tinged vinaceous-horny or umber at apex or extreme base. *Smell* none. *Spores* ellipsoid with germ pore, *11–13½/5¾–7* μ (Fig. 364), reddish brown sub micr., almost black in mass. *Basidia* 4-spored, 16–19/9–11 μ. *Marginal cystidia* (1) ± pointed lageniform or utriform, thin-walled, 28–62/10–16(21) μ; (2) clavate or pyriform, 16–33/9–24 μ (Fig. 498). *Facial cystidia mostly* ± *utriform*, *a few lageniform*, thin-walled, 44–67/14–18 μ, apex 8–15 μ (Fig. 499). Cells of cellular cap cuticle 20–42 μ diam.; beneath these are filamentous hyphae, some of which are orange-ochraceous encrusted-pigmented.

On soil in ash wood, Dowland Landslip, Rousdon, 29 Nov. 1958 (type in Herb. Kew). Resembling *P. bipellis* in vinaceous colours but differs in cap without scales from veil, smaller cystidia, gills not vinaceous, rather brighter colours, and more slender stature.

Psathyrella xanthocystis sp.nov. (Figs. 200, 369, 495)

Pileus 42–70 mm., e convexo expansus interdum obtuse umbonatus, umbrinus interdum ad discum rufotinctus, siccitate ochraceo-luteolo-brunneus vulgo ad discum fulvotinctus, jove pluvio ad marginem striatus, interdum senectute circa discum radialiter rugulosus, e velo albo appendiculato squamis dentatis aliquantum crassis primo ad marginem decoratus et fibrillis albo-sericeis ad partem externam adspersus. Lamellae adnatae interdum dente decurrentes, ± ventricosae, e pallide umbrino obscuriore umbrinae, subconfertae, L 30–38 l 3–7(11), ad aciem juventute albo-flocculoso-denticulatae. Stipes 55–80/5–8 mm. (ad basim 8–14), aequalis et ad basim incrassatus vel sursum attenuatus, albus vel albidus dein sursum cremeo vel ochraceo tinctus, ad apicem persistente pallidiore coloratus et vulgo a lamellis striatus, e velo albo, quod annulum pendulum striatum fugacem format, infra squamulis albidis adpressis floccoso-fibrillosis fugacibus obtectus, cavus, ad basim albo-tomentosus. Caro pilei concolorata, stipitis alba vel albida, a carne pilei manifeste denotata. Odor nullus. Sporae ellipsoideo-ovoideae poro germinativo, 7½–9/4¾–5½ μ (Fig. 369). Basidia 4-sporigera. Cystidia aciei lamellarum (1) lageniformia vel acute fusiformia, tenui- vel aliquantum crasso-tunicata, 40–58/10–12 μ; (2) clavata vel pyriformia tenuitunicata, 30–65/10–28 μ. Cystidia faciei lamellarum ± acute lageniformia vel fusiformia appendice acuta breve, crasso-tunicata (tunicis in NaOH lutescentibus), 52–70/10–12 μ, ad apicem 3–5 μ lata (Fig. 495). Cuticula pilei cellularis.

Ad lignum putridum Betulae, Badger Falls, Glen Affric, Inverness-shire, 6 Sept. 1957 (typus in Herb. Kew.). A P. jerdonii sporis brevioribus, pileo praecipue ad marginem e velo squamuloso, cystidiis faciei lamellarum differt. Cystidiis crassotunicatis in NaOH (vel KOH) lutescentibus insignis.

Cap 42–70 mm., convex then expanded, sometimes obtusely umbonate, *date-brown or umber*, sometimes with redder tinge at centre, drying ochraceous-buff often with tawny tinge at centre, *striate at margin* when moist, sometimes radially rugulose round centre when old, *white appendiculate veil* *forming rather thick dentate scales at margin at first* and leaving a few scattered white silky fibrils on outer part. *Gills* adnate, sometimes with tooth, ± ventricose, *pale then deeper date-brown or umber*, rather crowded, L 30–38 l 3–7(11), edge white flocculose-denticulate when fresh. *Stem* 55–80/5–8 mm. (8–14 mm. at base), equal with thickened base or attenuated upwards, *white or whitish then tinged cream or ochraceous from base*, apex persistently pale, silky fibrillose and often striate from gills, *white veil forming fugacious pendulous striate ring and adpressed whitish floccose-fibrillose scales below this*, hollow, base white tomentose. *Flesh* of cap concolorous, of stem white or whitish, sharply marked off from that of cap. *Smell* none. *Spores ellipsoid-ovoid with germ pore, 7½–9/4¾–5½ μ* (Fig. 369). *Basidia* 4-spored. *Marginal cystidia* (1) lageniform or pointed fusiform 40–58/10–12 μ, thin- or fairly thick-walled; (2) clavate or pyriform, thin-walled, 30–65/10–28 μ. *Facial cystidia ± acutely lageniform or fusiform with short point, thick-walled, walls yellowing in* NaOH, 52–70/10–12 μ, apex 3–5 μ (Fig. 495). Cap cuticle cellular. Veil structure not noted.

On rotten birch log, Badger Falls, Glen Affric, 6 Sept. 1957 (type in Herb. Kew). Differs from *P. jerdonii* in shorter spores, cap with veil mostly at margin, and thick-walled facial cystidia. Despite being collected from a birch log I think this is *Drosophila jerdonii* s. Kühn. & Romagn. collected from *Picea*, since all other characters agree; this cannot be *P. jerdonii* s. Berk. & Br., however, on account of different spores (see above, p. 374).

Rhodocybe melleopallens sp.nov. (Figs. 201–203, 372)

Pileus 7–20 mm., e convexo vel conico-convexo expansus, vulgo papillatus vel obtuse umbonatus, interdum senectute leviter depressus vel margine erecto, sordide mellinus vel luteolo-brunneus vulgo ad marginem pallidiore coloratus, hygrophanus, siccitate pallide sordide cremeus vel ochraceo-cremeus interdum fulvo-tinctus, jove pluvio ad marginem striatus, jove sicco opacus subnitidus interdum praecipue ad discum leviter minute sericeo-flocculosus. Lamellae adnatae dente decurrentes vel subdecurrentes, interdum ventricosae, pallide sordide cremeae vel pallide sordide luteolo-brunneae (colori pilei sicci fere similes), subconfertae, L 18–22 l (0)1–3, ad aciem fere integrae. Stipes 10–26/½–2 mm., aequalis vel deorsum attenuatus, vulgo flexuosus, sordide mellinus vel pallide luteolo-brunneus vulgo ad apicem pallidiore coloratus, ad apicem sub lente minute albido-pruinosus, farctus, juventute aliquantum firmus cartilagineusque, ad basim albotomentosus. Caro concolorata, siccitate intus pallide sordide cremea, juxta lamellas et in corticem stipitis obscuriore fusca vel colore cornus tincta. Odor et sapor forte farinacei (sectus magis olet). Sporae ellipsoideae vel leviter lacrimiformes, 5–6/3–3½ μ, sub immers. minute rugulosae, in lineamento interdum leviter angulatis (Fig. 372), in cumulo argillaceo-incarnatae. Basidia 4-sporigera. Cystidia nulla. Cellulae hypharum cuticulae pilei subcylindricae, 2–7 μ latae.

Sub Taxos et Fagos in solo calcareo: Norbury Park, Mickleham, 13 Oct. 1958 (typus in Herb. Kew.); Mickleham Downs, Surrey, 18 Oct. 1958 (sub Taxos). R. nitellinae (sporis 6–8½/4–5 μ (Fig. 373)) affinis, sed a sporis brevioribus et coloribus minus claris differt. Collybia ferruginella a sporis in cumulo albis et laevibus differt.

Cap 7–20 mm., convex or conico-convex then expanded, generally papillate or obtusely umbonate, sometimes slightly depressed or with upturned margin when old, *honey-buff or dull honey to yellowish date-brown* often paler at margin, *hygrophanous*, drying pale dirty cream or ochraceous-cream, often with slight tawny tinge when half dry, *striate at margin when moist*, opaque and sometimes minutely silky flocculose (especially at centre) but rather shiny when dry. *Gills* adnate with tooth to subdecurrent, sometimes ventricose, *pale dirty cream or pale buff* (much like colour of dry cap), subcrowded, L 18–22 l (0)1–3, edge concolorous, ± even. *Stem* 10–26/½–2 mm., equal or attenuated downwards, often flexuose, *dull honey to pale date-brown often paler at apex*, apex minutely whitish pruinose under lens, stuffed, rather firm and tough and cartilaginous when fresh, base slightly white tomentose. *Flesh* concolorous, drying dirty cream or pale buff in centre of cap and stem, *darker horny-buff or date-brown-horny over gills and in stem cortex* (shows as continuous dark line in vertical section even when almost dry). Strong mealy *taste* and *smell*, especially when cut. *Spores* ellipsoid or slightly tear-drop shape, *5–6/3–3½ μ*, *minutely rugulose sub immers.*, outline slightly angular seen end-on (Fig. 372), clay-pink in mass. *Basidia* 4-spored. *Cystidia* absent. Hyphae of cap cuticle filamentous, 2–7 μ diam.

Under yew and beech on chalky soil: Norbury Park, Mickleham, 13 Oct. 1958 (type in Herb. Kew); Mickleham Downs, 18 Oct. 1958 (under pure yew). Looks rather like a small *R. nitellina* (spores 6–8½/4–5 μ (Fig. 373)) but differs in shorter spores and duller colours. *Collybia ferruginella* differs in having smooth spores, white in mass.

STROPHARIA AURANTIACA (Cooke) P. D. Orton (see p. 181 and Figs. 204–207, 374, 492, 493)

Near Porlock, Somerset, I found a very striking, dark red agaric with violaceous-brown spores which I suspected to be a Stropharia. In Cooke's *Illustrations of British Fungi* I found a plate very much like my collection over the name *Agaricus* (Stropharia) *thraustus* var. *aurantiacus*. *A.* (S.) *thraustus* is generally regarded as either a variety or synonym of *S. squamosa*, but I have listed both for the time being (for reasons see below) and have raised var. *aurantiacus* to a species, because my Somerset agaric seems sufficiently distinct from the much duller coloured *squamosa*, despite rather similar spore characters. All specimens I found were similarly red-coloured and at later dates at the same place I made other collections all entirely red, and there was no indication of any intermediates with *squamosa*. The ring does not seem to be so well marked as in *squamosa* but further field work is necessary to be sure that this is always so. The one collection of *S. squamosa* I have examined in recent years had no facial cystidia or chrysocystidia on the gills. If this is always so, it is an additional clear distinction between *squamosa* and *aurantiaca*, all collections of the latter having abundant facial chrysocystidia. I have kept *aurantiaca* in *Stropharia* and not transferred it to *Hypholoma*, despite the sometimes indistinct ring, on account of the distinctly viscid moist cap. *S. thrausta* is depicted with a well-marked membranous ring and seems to have a rather paler cap; I have not collected an agaric corresponding to *S. thrausta* so must leave the problem of its identity for later solution; *S. thrausta* s. J. Lange looks distinct from *S. aurantiaca* on account of the ring and cap colour and is left in the 'List'; should this be collected again the presence or absence of facial chrysocystidia will be critical for determining the status of the epithet *thrausta*. Here is a description of my collection of *aurantiaca*:

Cap 16–56 mm., convex then expanded-convex, margin remaining incurved for some time, sometimes broadly obtusely umbonate, *red-lead or crimson-lake to deep wine-red*, sometimes slightly paler at margin, viscid when moist, wrinkled-rugulose round centre and slightly paler in places when dry, *margin with dentate scales from white or whitish later slightly yellowish veil at first. Gills* adnate, sometimes slightly emarginate, *whitish then pale olivaceous or clay-olive, finally olive-umber*, rather crowded, L 26–36 l 3, edge white flocculose at first, later sometimes with reddish stains (also sometimes in places on faces of gills). *Stem* 16–100/2–8 mm. (< 15 mm. at base), equal with clavate-bulbous or slightly thickened base, *whitish then pale yellowish or ochraceous, sometimes flushed with colour of cap or crimson-lake in places when handled*, sometimes fading again when dry, apex white pruinose, whitish or slightly yellowish fibrillose-floccose veil forming ring-zone and patches below this, sometimes later disappearing and leaving stem streaky-striate, stuffed then hollow, base white tomentose. *Flesh* in cap concolorous, yellowish or ochraceous in stem, often red in places when cut, drying pale ochraceous or slightly reddish. *Smell* none. *Spores* ellipsoid with germ pore, 11–13/6–7½ μ (Fig. 374), purplish-brown in mass. *Basidia* 4-spored 34–38/10–11 μ. *Marginal cystidia* cylindric-fusiform or slightly lageniform, often flexuose, 30–40/5–8 μ, apex 3–6 μ (Fig. 492). *Facial cystidia* clavate with or without pointed appendage, chrysocystidia (contents yellowish in NH_4OH, Fig. 493). Hyphae of cap cuticle filamentous, clamped, 6–12 μ diam.

On sawdust (probably coniferous), Bossington, Som., 30 Oct. 1957, 23 Nov. 1957 (exsiccata of both collections in Herb. Kew), 7 Nov. 1959. Very readily distinguished by striking red colours, unlike any other *Stropharia* known to me.

STROPHARIA PERCEVALII (Berk. & Br.) Sacc. (Fig. 375)

The spores of type material of *Agaricus* (Stropharia) *percevalii* Berk. & Br., 1879, are ellipsoid with a slightly oblique apiculus and well-marked germ pore, 13–15/6½–8 μ (Fig. 375*a*). In *Friesia*, **5** (1954), 11, Pilát & Nannfelt described *S. magnivelaris* Peck apud Sacc. and placed *A.* (S.) *percevalii* as 'Syn. ?', remarking in the text that 'Fungus lapponicus cum descriptionibus *Str. percevalii* B. & Br. satis concordat. Sporae huius species teste Cooke et Rea 16–17/7 μ; Massee sporas paulo minores (12–14/6 μ) indicat' and rejecting the epithet *percevalii* on account of uncertain identity. I have examined spores of the material from which Cooke's plate in *Illustrations of British Fungi* was painted and found them also to be 13–15/6–7½ μ and of the same shape as type *percevalii* (Fig. 375*b*). Older authors therefore gave incorrect spore measurements which can be discounted. Thus, I think there need be no doubt that *S. percevalii* (the prior name) is the same as *S. magnivelaris* as described by Pilát & Nannfelt. I have therefore included *percevalii* in the list with *S. magnivelaris* as synonym.

VOLVARIELLA

After sorting out the plates of the species of *Volvariella* (= *Volvaria*) for quotation in the 'List', I am of the opinion that there has been some confusion of names in this group. Probably owing to the relative rarity of most species the same name has been used by different mycologists for different species. I have attempted to sort out this confusion, and to make clearer my conception of the species included in the 'List' (for synonymy see Part IB) I have prepared this short key (cystidial characters are omitted from some species owing to lack of reliable information).

Key to species of Volvariella

1. Cap distinctly viscid, smooth; spores 11–18/7–10 μ **2**

1. Cap dry (except sometimes in *parvula*), smooth, silky-fibrillose or silky-scaly; spores not more than 10 μ long **3**

  2. Robust; cap 70–150 mm., ivory-whitish to smoky-grey or sepia, very viscid when moist; stem 10–25 mm. diam.; volva white then whitish or greyish (much the commonest species in Britain) *speciosa*

  2. Smaller; cap 30–50 mm., ivory-whitish; stem *ca.* 4–6 mm. diam.; volva white *media*

3. Robust, growing on wood; spores 8–10/5–6 μ; cap 70–150(200) mm., white then lemon-yellowish, entirely silky-scaly; volva large, soon sepia or olive-brownish on the outside; not uncommon especially on elm *bombycina*

3. Not growing on wood or if so, smaller and with different cap characters; spores rarely exceeding 8 μ in length **4**

  4. Parasitic on other agarics (commonly *Clitocybe nebularis* or, sec auct. gall., *Tricholoma* spp.); white or whitish; volva white or slightly discoloured; spores ellipsoid, 5–6½/3½–4 μ (uncommon at present) *surrecta*

  4. Not so **5**

5. Volva brownish or olive-grey outside; small to medium agarics **6**

5. Volva white outside or only slightly discoloured whitish or dirty brownish with age; rather small **7**

  6. Cap adpressed felty-fibrillose at first then innately fibrillose or minutely dark brown fibrillose streaky; spores 6–8/3–4 μ, ellipsoid or coffin-shaped; volva brownish or sepia-grey outside, at least in part
  volvacea (non s. Kühn. & Romagn. which is an alien with larger spores)

  6. Cap minutely whitish silky fibrillose, later innately silky fibrillose (often radially so round centre), margin silky lacerate, grey or tinged olive or brownish at centre, often whitish at margin; spores 6–7/4–5 μ, ovoid or slightly coffin-shaped; volva brownish grey or olive-grey-sepia outside *taylori*

7. Cap grey, entirely silky-fibrillose scaly, margin lacerate; volva white; stem white, silky-striate (slightly greyish when old); spores 6–8/4–5 μ, ellipsoid; in grass *murinella*

7. Cap white then sometimes discoloured slightly brownish or dirty yellowish when old, silky-smooth or silky-scaly **8**

  8. Stem entirely downy-pubescent (easily seen with, often without, lens); cap entirely delicately silky-fibrillose scaly, margin ciliate-lacerate; spores 6–7½/4–4½ μ (Fig. 376), ellipsoid or coffin-shaped (Fig. 370); usually in woods *pubescentipes*
  (If *hypopithys* on coniferous needles is identical, this epithet has priority)

  8. Stem silky-striate or smooth; cap silky-smooth or minutely silky-fibrillose, sometimes slightly viscid; spores 5½–6½/4–5 μ, ovoid; usually in grass in fields *parvula*

VOLVARIELLA PUBESCENTIPES (Peck) Singer (Figs. 208, 376, 496, 497)

On one of the day forays of the British Mycological Society at Norbury Park, Mickleham, Surrey, a pure white *Volvariella* was collected, which I have identified as *V. pubescentipes*. Though *Volvaria parvula* var. *biloba* is probably identical, this is the first certain British record of *pubescentipes*, and since there is no readily accessible description in English, I give one of this collection:

Cap 20 mm., convex-expanded, slightly umbonate, *pure white* then with very slight creamy tinge at centre, *entirely delicately silky-fibrillose scaly*, scales recurved in outer part, margin ciliate-lacerate. *Gills* free, white then pinkish, crowded, L 48 l (0)1(3), edge very minutely flocculose. *Stem* 50/2 mm., slightly thickened at base, pure white above tinged slightly creamy-ochraceous at base, *entirely downy-pubescent when fresh* (hairs outstanding); volva *white*, split into three rather pointed lobes. *Flesh* white. No *smell* noticed. *Spores ellipsoid or coffin-shaped*, *6–7½/4–4½ μ* (Fig. 376). *Basidia* 4-spored, *ca.* 32/8–10 μ. *Marginal cystidia* lageniform or clavate often with short beak, when lageniform sometimes slightly swollen at apex, 40–70/(10)14–22 μ (Fig. 496). *Facial cystidia* ± lageniform, neck tapered or parallel-sided, numerous, 55–72/16–22 μ, apex 4–10 μ (Fig. 497). Hairs on stem slightly thinner towards apex, 7–20(25) μ diam. with apex 5–8 μ, hyaline, no clamps seen, terminal cells often long (*ca.* 200–400 μ), thin-walled. Hairs on cap similar but shorter, 8–30 μ diam., apex 6–14 μ, terminal cell *ca.* 60–200 μ.

In leaves (mostly beech) by road, Norbury Park, Mickleham, Surrey, 13 Oct. 1956, legit Miss M. L. Chalk.

REFERENCES

(Most of the references are given in full in the relevant places in the text. Below are some commonly referred to in the usual form. The 'List', mentioned frequently, is 'The New Check List of British Agarics and Boleti' in these *Trans.* **43**, Suppl., 1960, in which a list of works consulted is given.)

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BSMF = *Bull. Soc. mycol. Fr.*

RM = *Rev. mycol., Paris.*

(*Accepted for publication* 10 *May* 1959)

ADDENDUM

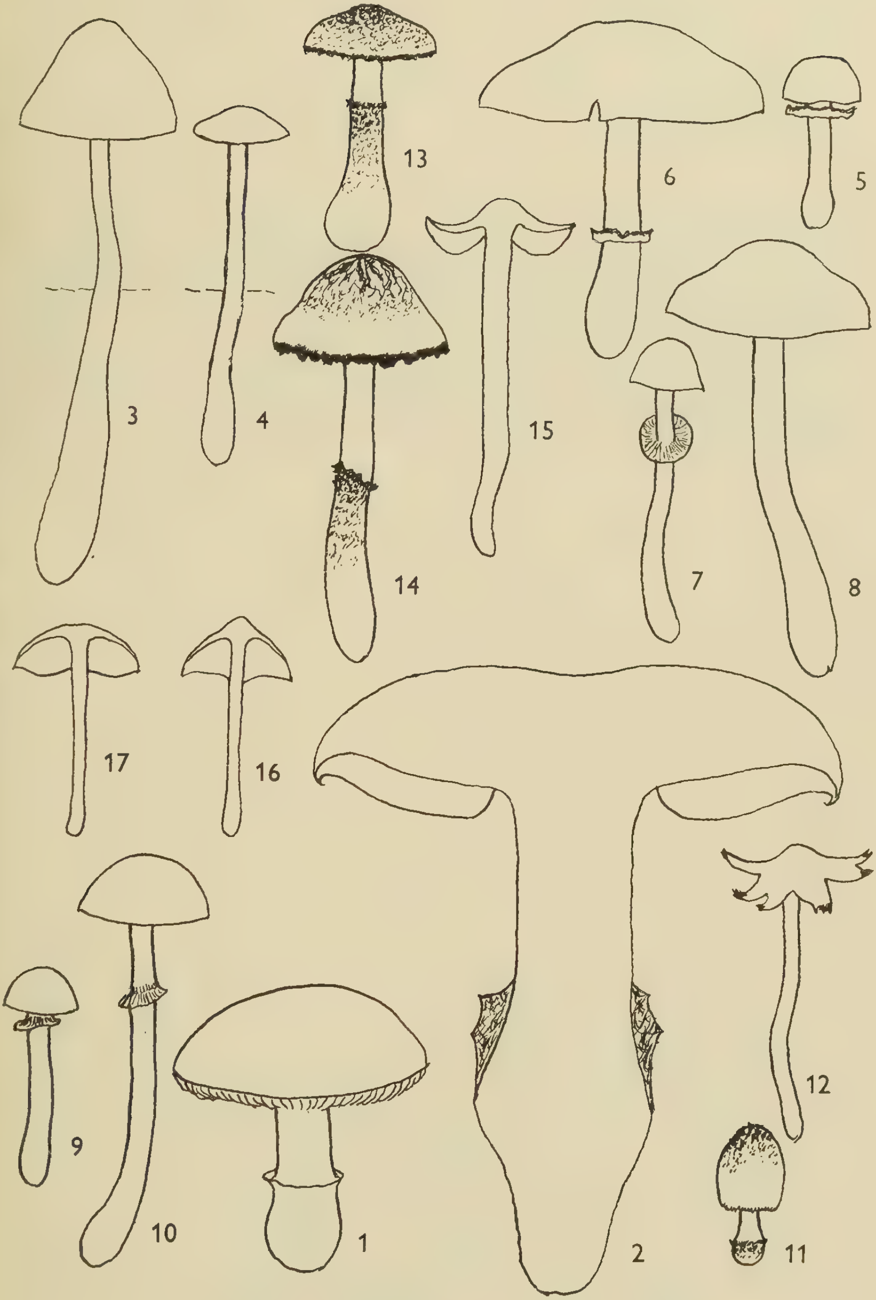
Cortinarius (Sericeocybe) **subargentatus** sp.nov.

Pileus 30–55 mm., e convexo expansus interdum umbonatus, primo argenteo-albus vel solum pallidissime violaceotinctus dein pallide sordide ochraceus disco albido vel cremeo, senectute interdum ad marginem pallide ferrugineo-fulvus, sericeo-nitidus, sub lente radialiter fibrilloso-sericeus. Lamellae e violaceo mox argillaceo-violaceae vel argillaceo-ochraceae dein ferrugineo-luteolobrunneae, subconfertae, L 34–48 l(1) 3, ad aciem vulgo serrulatae. Stipes 35–75/5–9 mm. (ad basim 7–18 mm.), clavato-bulbosus, pileo concoloratus dein albidus vel pallide ochraceus, ad apicem persistenter violaceus, senectute infra sordide luteolobrunneus, sericeo-glaber vel -striatus, sine velo distincto, cavus; cortina copiosa, argentea vel pallide violacea. Caro primo obscure caeruleo-violacea dein albida vel pallide ochracea. Odor nullus vel debilis. Sporae ellipsoideae, 8–10/5–6 μ, minute punctatae. Acies lamellarum fertilis.

In silvis humidis praecipue betuletis: Badger Falls, Glen Affric, Inverness-shire, 21 Sept. 1956 (typus in Herb. Kew.); Rothiemurchus, Inverness-shire, 25 Sept. 1956. A C. alboviolaceo absentia veli, coloribus pallidioribus et statura minore distinguitur. C. argenteus ab absentia veli, coloribus violaceis magis et statura robustiore differt. C. (Inoloma) kauffmannianus R. Henry, 1946 (nom. nud.) idem est (non C. (Hydrocybe) kauffmannianus A. H. Smith, 1933).

For description in English see Orton (1958), p. 102.

Figs. 1, 2. *Agaricus gennadii*, Friston, 17 Nov. 1956, showing volvate veil. Figs. 3, 4. *Conocybe dunensis*, Dawlish Warren, 26 Nov. 1955, showing stems buried in sand (level indicated by horizontal line—del. T. J. Wallace). Figs. 5–8. *C. percincta*: 5, 6, Wretham Meres, 2 Oct. 1958; 5, showing large ring entirely covering gills; 6, older specimen; 7, 8, Covenhope, 21 Nov. 1959; 7, showing striate ring; 8, older specimen with ring washed off. Figs. 9, 10. *C. vexans*, Guisachan, 19 Sept. 1958. Fig. 11. *Coprinus ellisii*, Wheatfen, 9 July 1958, unexpanded specimen showing ochraceous scaly veil on cap and at stem base. Fig. 12. *C. saccharomyces*, Carnwath, 28 Sept. 1958, partially expanded specimen with radially split cap. Figs. 13–15. *Cystoderma simulatum*, Surlingham Wood, 12 Oct. 1957, with granular-scaly veil on cap and stem and appendiculate from cap margin. Figs. 16, 17. *Deconica muscorum*, Dawlish Warren, 5 Dec. 1953 (del. T. J. Wallace). (All × 1.)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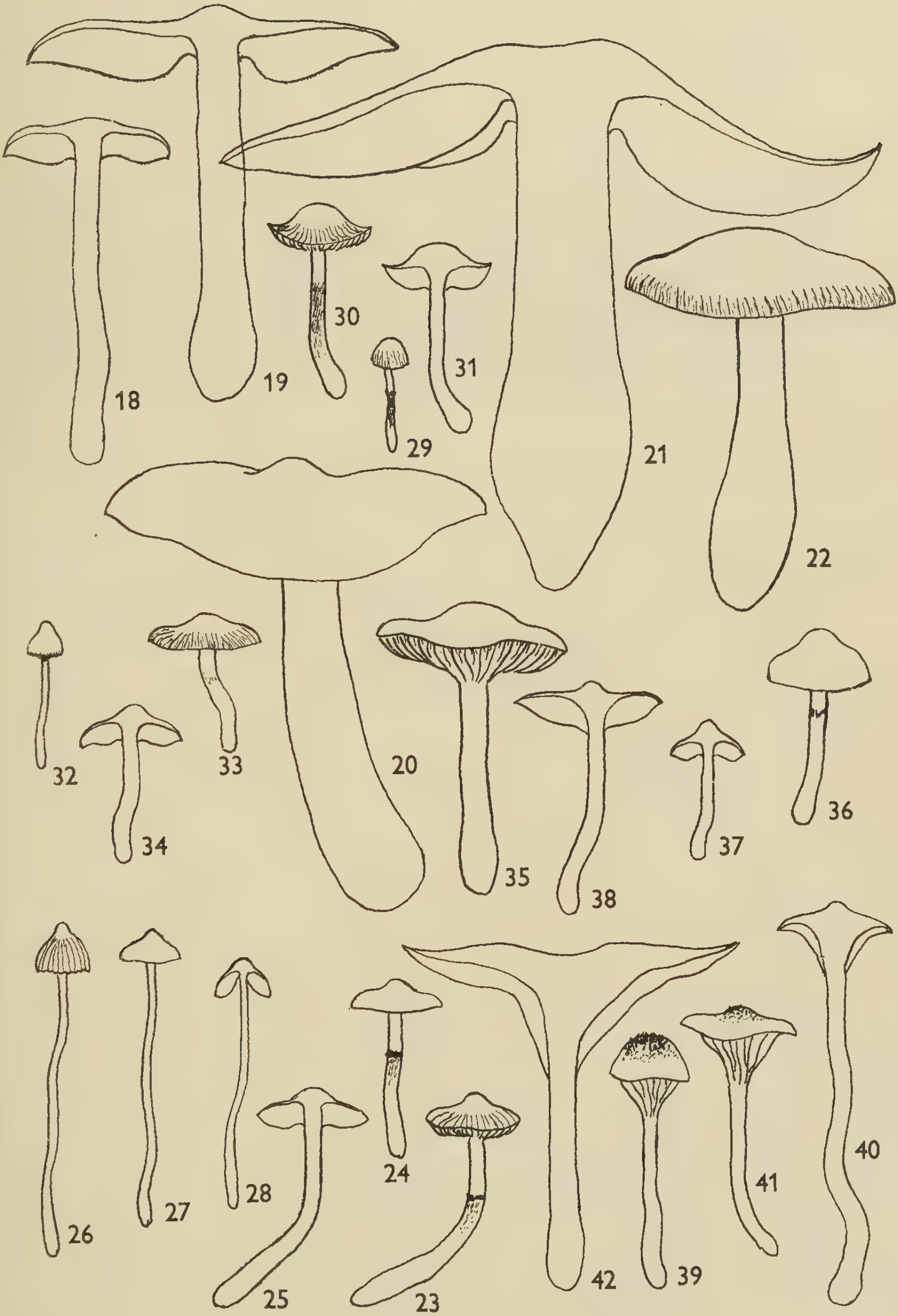
Figs. 18, 19. *Entoloma fuscomarginatum*, Tomich, 18 Sept. 1958, and Holt Lowes, 5 Oct. 1958. Figs. 20–22. *E. majaloides*: 20, Loch Craiglush, 4 Sept. 1954; 21, Loch-an-Eilean, 8 Sept. 1957; 22, Lower Tullochgrue, Rothiemurchus, 8 Sept. 1958, showing striate cap margin. Figs. 23–25. *Galerina ampullaceocystis*, showing striate cap and veil on stem. Figs. 26–28. *G. calyptrata*, Plym Valley, 29 Aug. 1956, showing striate cap. Figs. 29–31. *G. cinctula*: 29, Mousewood Farm Wood, 10 July 1958, showing veil on stem; 30, 31, Glen Einich, 29 Aug. 1956, showing veil on stem (× 2). Figs. 32–34. *G. luteofulva*, Mortimer, 26 Oct. 1954: 32, showing traces of veil on cap margin and at stem apex on young specimen; 33, striate cap. Figs. 35–38. *G. salicicola*: 35, 36, Epsom Common, 1 Oct. 1952; 37, 38, same locality, 3 Oct. 1955. Figs. 39–42. *Hygrophoropsis fuscosquamula*: 39, 40, Speech House, 11 Sept. 1955, showing scales on cap; 41, 42, Silchester Common, 17 Oct. 1955. (All × 1, except Figs. 30, 31.)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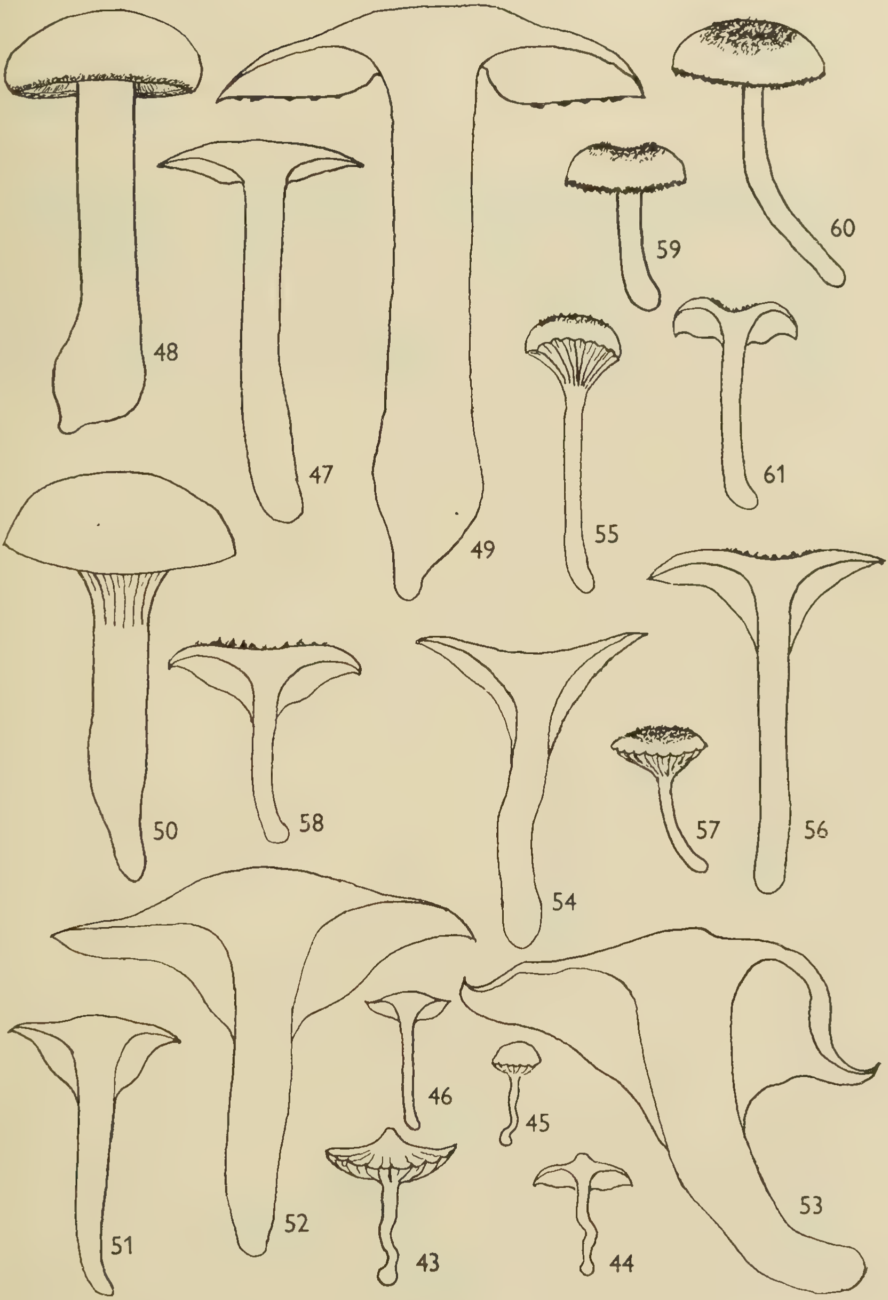
Figs. 43–46. *Galerina embolus*: 43–45, Dawlish Warren, 19 Dec. 1956, showing striate cap (del. T. J. Wallace); 46, Rock, 9 Nov. 1957. Figs. 47–49. *Hebeloma leucosarx*: 47, Little Brechin, 2 Sept. 1954; 48, 49, Bookham Common, 15 Oct. 1955; 48, young specimen showing incurved minutely tomentose cap margin; 49, older specimen with weeping gills. Figs. 50–54. *Hygrophorus* (Camarophyllus) *berkeleyi*: 50–52, Membury, 3 Nov. 1956; 53, Membury, 25 Oct. 1957, robust distorted specimen; 54, Bindon Landslip, 2 Dec. 1958. Figs. 55–58 (del. T. J. Wallace). *H.* (Hygrocybe) *coccineocrenatus*: 55, 56, Studland, 23 July 1952, showing dark brown scales on cap; 57, 58, Studland, 30 Sept. 1955 with scales on cap. Figs. 59–61. *H.* (H.) *turundus*, Rothiemurchus, Inverness-shire, 28 Aug. 1955, showing brown scales on cap and lacerate cap margin. (All × 1.)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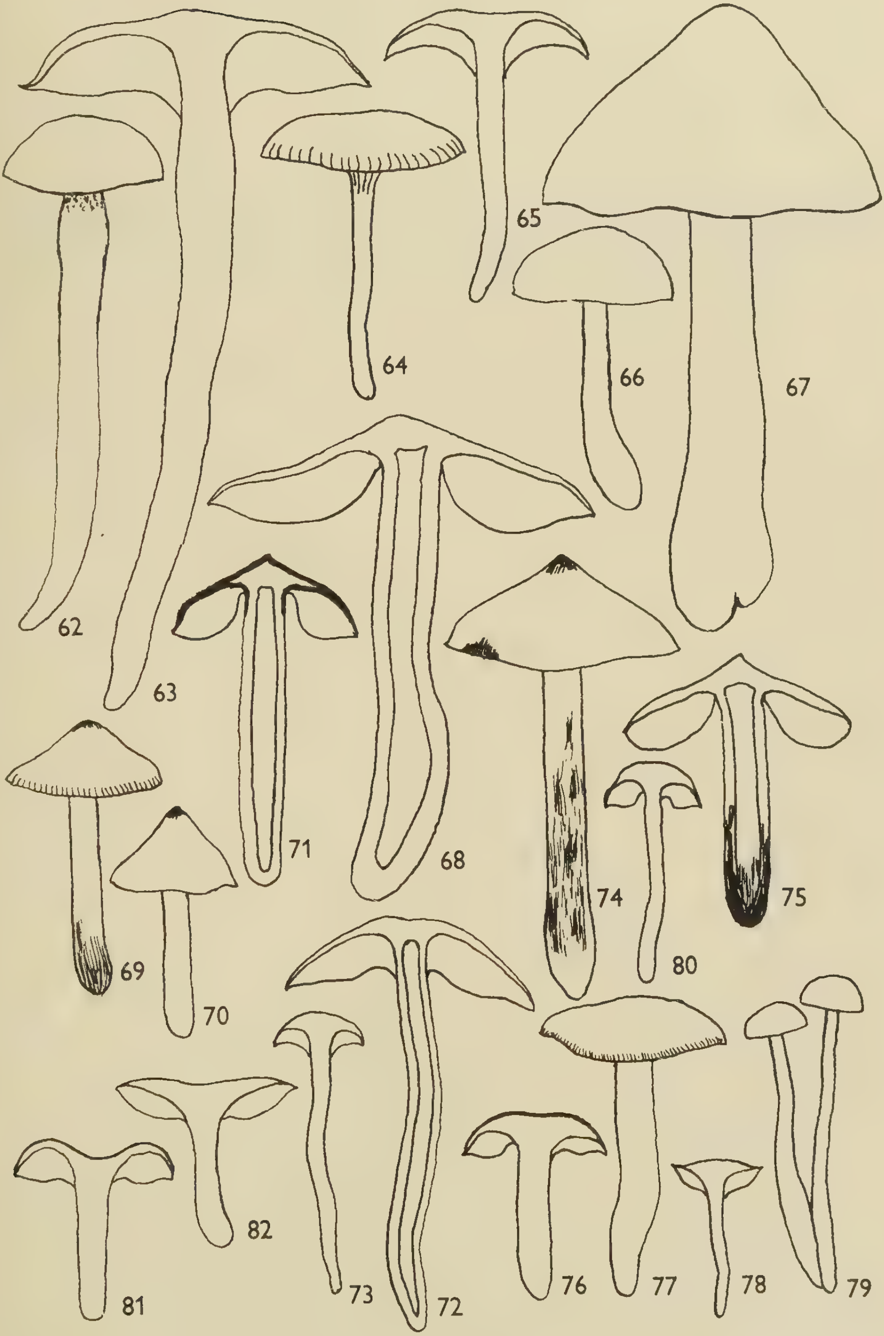
Figs. 62, 63. *Hygrophorus* (Hygrophorus) *mesotephrus*, Lyndhurst Road, 19 Nov. 1958, showing white floccose-scaly stem apex. Figs. 64, 65. *H.* (Camorophyllus) *subviolaceus*, Membury, 2 Nov. 1957, showing striate cap. Figs. 66–68. *H.* (Hygrocybe) *aurantiosplendens*, Membury, 5 Nov. 1956. Figs. 69–71. *H.* (H.) *conicoides*: 69, 70, Bossington, 31 Nov. 1957, showing blackened cap centre and stem base; 71, Rock, 9 Nov. 1957, showing red flesh in cap. Figs. 72, 73. *H.* (H.) *marchii*: 72, Tomich, 13 Sept. 1956; 73, Guisachan, 18 Sept. 1956, young specimen with decurrent gills. Figs. 74, 75. *H.* (H.) *olivaceoniger*, Holkham, 6 Oct. 1958, showing partially blackened cap and stem. Figs. 76–80. *H.* (H.) *strangulatus*: 76, 77, Dawlish Warren, 24 Nov. 1956, showing shortly striate cap margin; 78–80, Studland, 29 Oct. 1956. Figs. 81, 82. *H.* (H.) *substrangulatus*: 81, Studland, 27 Oct. 1955; 82, Studland, 17 Nov. 1958. (All × 1.)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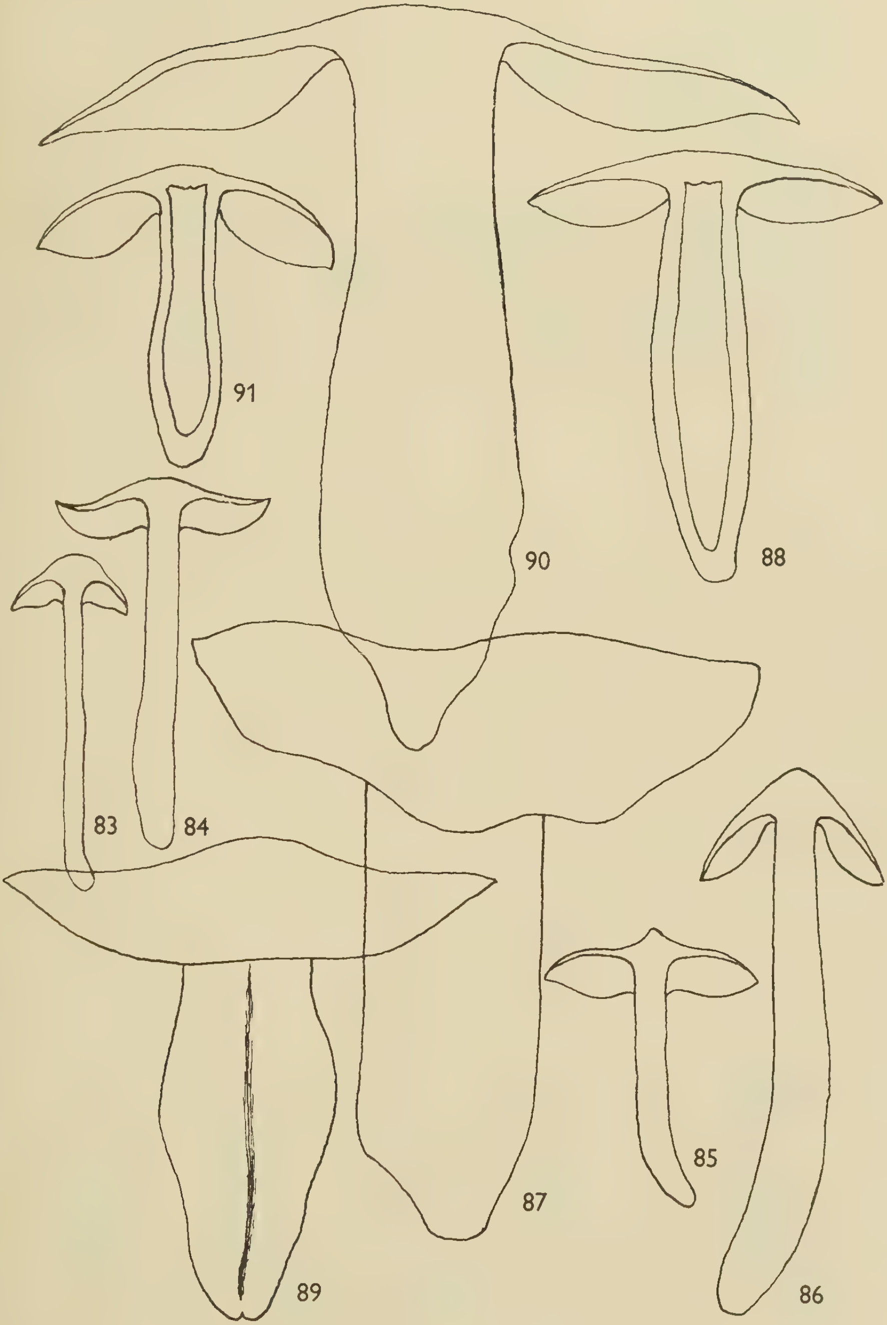
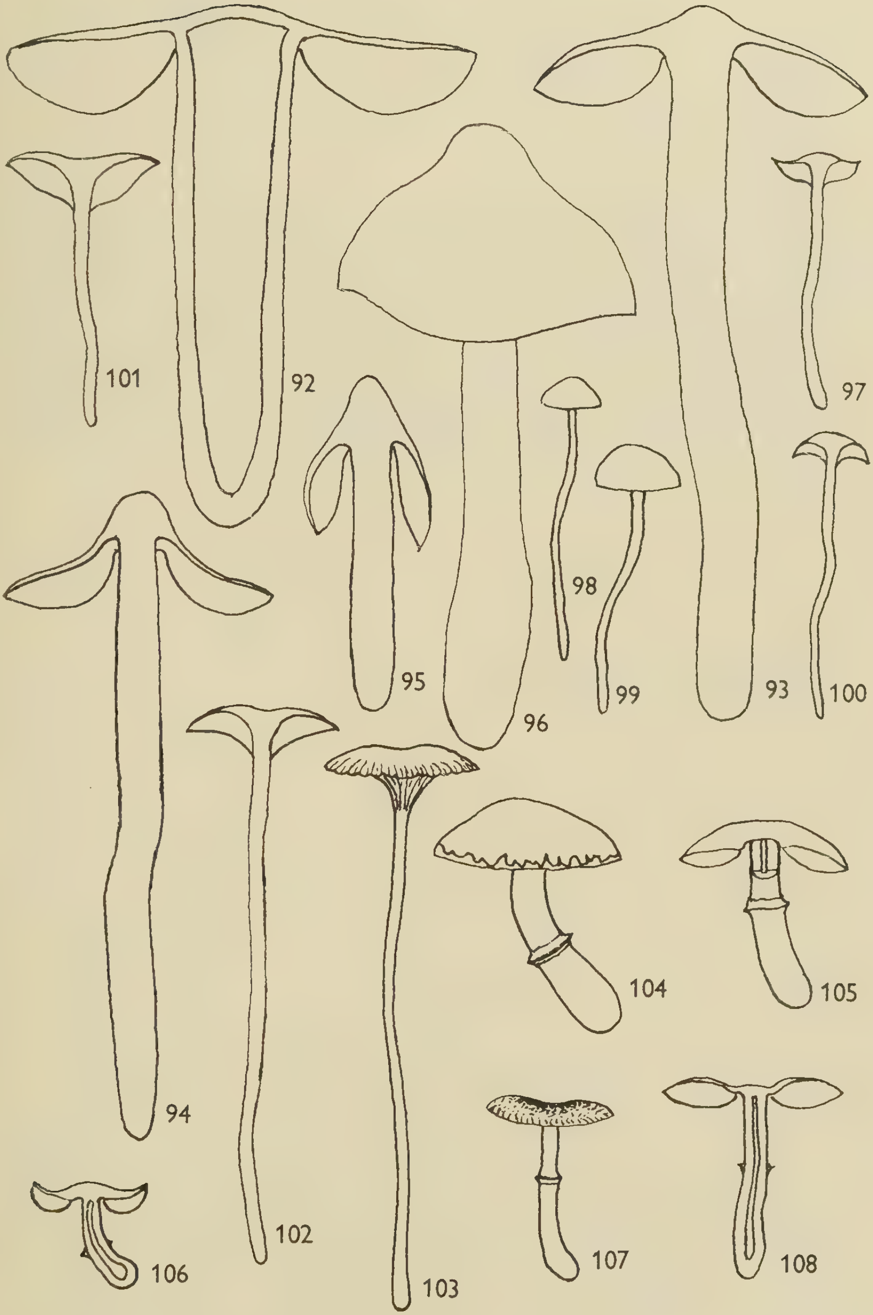
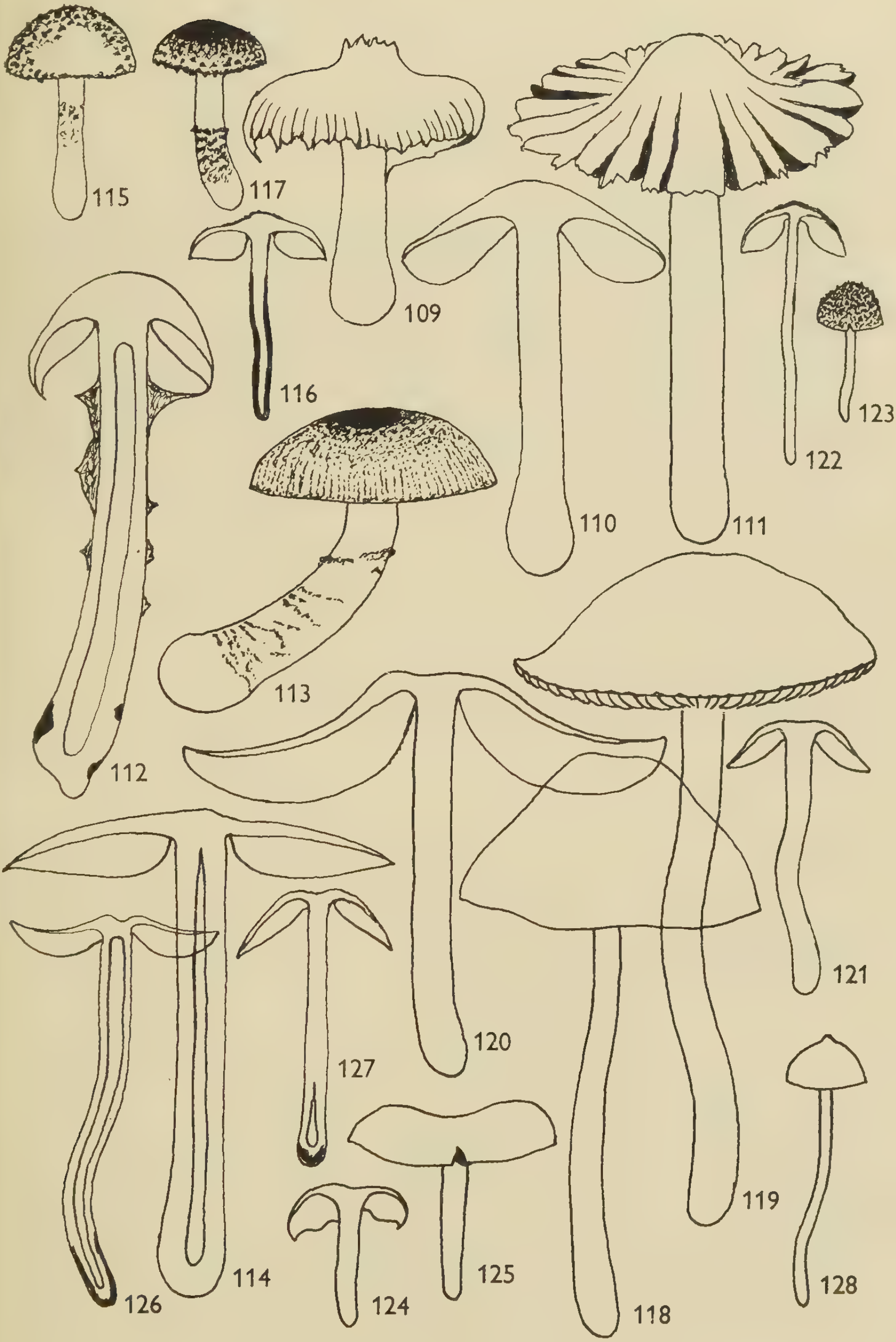
Figs. 83–85. *Hygrophorus* (Hygrocybe) *coccineus*, Membury, 5 Nov. 1956, normal-sized specimens. Figs. 86–91. *H.* (H.) *splendidissimus*: 86, Tomich, 28 Aug. 1957, young specimen; 87, 88, Membury, 29 Oct. 1957, average size (88) and robust specimen (87); 89, 90, Shaugh, 7 Nov. 1957, specimen with compressed channelled stem (89), large specimen (90); 91, Bossington, 23 Nov. 1957, small specimen. (All × 1.)



Figs. 92, 93. *Hygrophorus* (Hygrocybe) *konradii*: 92, Ashurst Valley, Boxhill, 2 July 1955; 93, Polesden Lacey, 14 Oct. 1958. Figs. 94–96. *H.* (H.) *subglobisporus*: 94, Ingleton, 24 Aug. 1958; 95, 96, Mickleham Downs, 18 Oct. 1958. Figs. 97–101. *H.* (H.) *subminutulus*: 97, Chatsworth, 11 Sept. 1956; 98–101, Membury, 4 Nov. 1956. Figs. 102, 103. *H.* (H.) *xanthochrous*, Rothiemurchus, 16 Sept. 1956, showing striate cap. Figs. 104–106. *Lepiota brunneocingulata*: 104, 105, Kenley Bottom, 24 Nov. 1958; 104, showing ring and excoriated cap margin; 105, section of cap and upper part of stem, lower part complete with ring; 106, Bindon Landslip, 29 Nov. 1958. Figs. 107, 108. *Lepiota tenera*, Surlingham Wood, 18 Oct. 1957, showing scales on cap, also ring. (All × 1.)



Figs. 109–111. *Inocybe* (Inocybe) *devoniensis*, Braunton, 26 Aug. 1952: 109, young specimen with appendiculate veil still present on one side (del. T. J. Wallace); 111, Braunton, 14 Oct. 1952, older specimen with radially split cap (del. T. J. Wallace). Figs. 112–114. *Lepiota ochraceofulva*, Mousewood Farm Wood, 8 Oct. 1958, showing scaly cap and coloured veil on stem; 112, has three tawny-rusty spots near stem base. Figs. 115–117. *L. rosea*, Langcliffe Brow, 17 Sept. 1953; 115, showing granular floccose veil on cap and stem; 116, 22 Sept. 1957, showing wine-brown flesh in stem; 117, 29 Aug. 1958, showing more regularly arranged scales on cap and stem. Figs. 118–121. *Leptonia anatina*, Broomfield Hill, 14 Aug. 1958. Figs. 122, 123. *L. inocybeoides*: 122, Dawlish Warren, 27 Oct. 1956; 123, Dawlish Warren, 17 Nov. 1956, showing scaly cap. Figs. 124, 125. *L. indutoides*, Ingleton, 28 Aug. 1958. Figs. 126–128. *L. pyrospila*: 126, Tomich, 27 Aug. 1957, showing orange vermilion in outer part of stem base; 127, 128, Membury, 25 Oct. 1957, with similar colour in stem base (127) and young papillate specimen (128). (All × 1.)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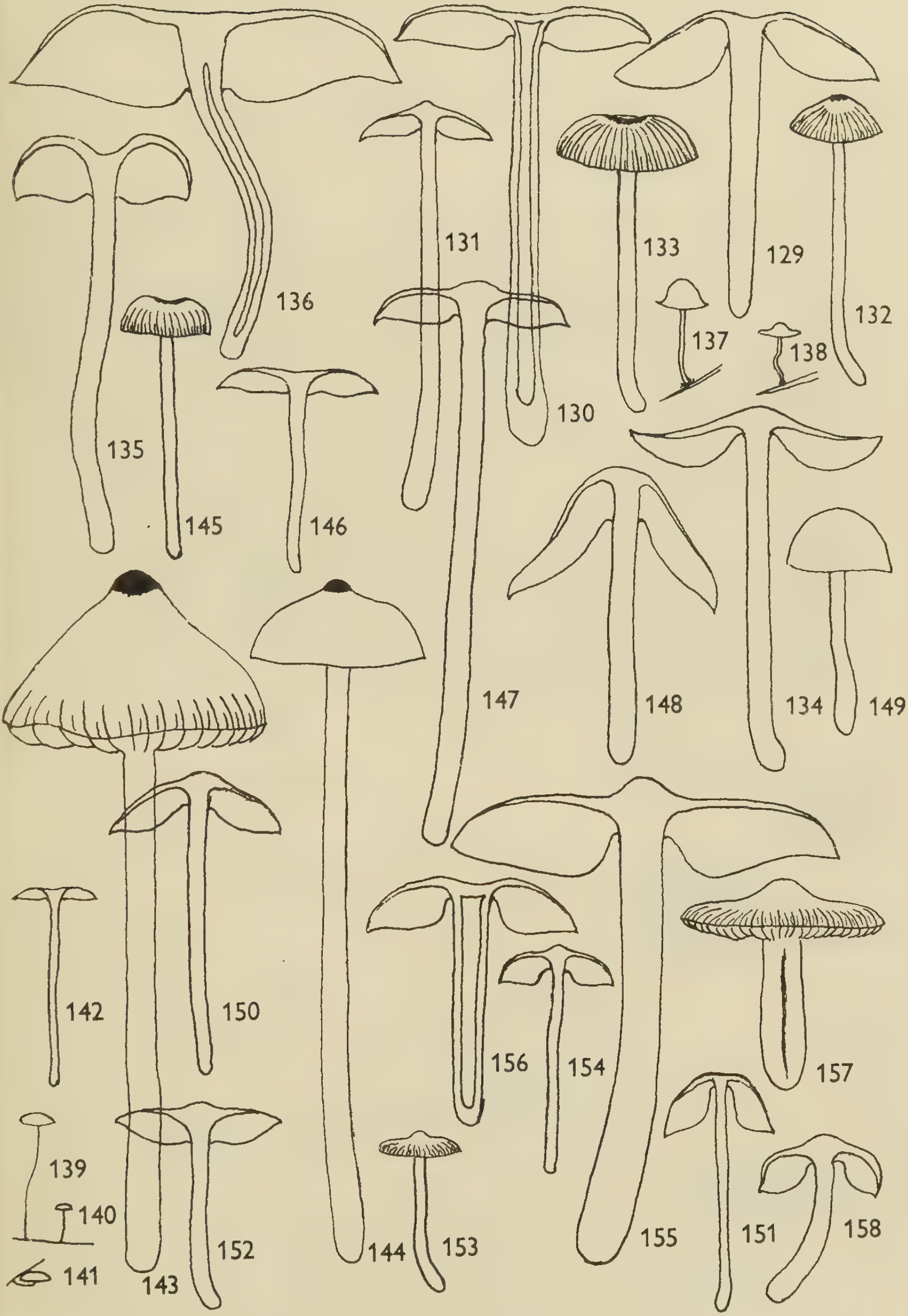
Figs. 129–134. *Leptonia fulva*: 129, Loch-an-Eilean, 26 Aug. 1955; 130–132, Lower Tullochgrue, Rothiemurchus, 27 Aug. 1955, showing striate cap and slightly scaly cap centre; 133, 134, Membury, 1 Nov. 1957, showing striate cap and slightly scaly cap centre. Figs. 135, 136. *L. pernitrosa*, Studland, 21 Nov. 1955. Figs. 137, 138. *Mycena lactella*, Freshfield, 13 Nov. 1958, on pine needles. Figs. 139–142. *M. tortuosa*, Membury, 1 Nov. 1956; 139–141, on bits of twig; 142, section, × 2. Figs. 143, 144. *Nolanea cuneata*: 143, Rothiemurchus, 25 Sept. 1956; 144, Stormont Loch, 4 Oct. 1956, paler apical spot on cap shown black in both. Figs. 145–147. *N. farinolens*: 145, 146, Guisachan, 24 Aug. 1955, showing striate cap; 147, Thack Marsh, Wheatfen, 17 July 1956. Figs. 148, 149. *N.*? *lucida*, Glenesk, 5 Sept. 1955. Figs. 150–155. *N. lucida*: 150, 151, Clapham Wood pastures, 27 Aug. 1958: 152, 153, Bossington, 30 Oct. 1957, showing striate cap; 154, Membury, 27 Oct. 1957. Fig. 155. Membury, 2 Nov. 1957, large specimen. Figs. 156–158. *N. radiata*: 156, 157, Dawlish Warren, 27 Oct. 1956, showing striate cap; 158, Berrow, 26 Nov. 1956. (All × 1, except Fig. 142.)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Figs. 159–161. *Nolanea tenuipes*: 159, Mickleham Downs, 1 Oct. 1954; 160, Druid's Grove, Norbury Park, 2 Oct. 1954, large specimen; 161, Wheatfen Carr, 18 July 1956, with umbilicate cap. Figs. 162–166. *Omphalina fusconigra*: 162, Glenesk, 30 Aug. 1952; 163, Keasden Moss, 8 Sept. 1952; 164, Keasden Moss, 15 Sept. 1953, showing striate cap; 165, 166, Blairdrummond, 28 Sept. 1957, showing young specimen with incurved margin. Figs. 167, 168. *O. hepatica*, Dawlish Warren, 8 Dec. 1956, specimen with incurved silky-hoary margin. Fig. 169. *Pholiota aromatica*, Guisachan, 5 Sept. 1957, part of clump showing scales on cap and stem on younger specimens and darker stem base. Figs. 170, 171. *Pleurotellus patelloides*, Bindon Landslip, 29 Nov. 1958: 170, showing tomentose cap; 171, view from beneath. Fig. 172. Section, ×2. Figs. 173–175. *Pluteus boudieri*, Juniper Hill, 26 Sept. 1953: 173, specimen with whitish cap with pinkish striate-sulcate margin and stem with tomentose bulb; 174, Clapham Wood, 21 Sept. 1957, small specimen with darker flesh in cap; 175, Mountain Wood, East Horsley, 25 June 1958, large specimen with dark flesh at stem apex. Fig. 176. *P. griseopus*, Stinchcombe, 13 Sept. 1955, showing grey flesh in stem cortex. Fig. 177. *P. punctipes*, Druid's Grove, Norbury Park, 13 Oct. 1956, showing small brown scales on cap and stem and striate cap margin. Figs. 178, 179. *P. podospileus*: 178, Wheatfen Carr, 23 Oct. 1956, 179, Surlingham Wood, 9 July 1958, both showing cap and stem with small punctate scales, which give a falsely striate appearance to the cap margin. Figs. 180–183. *P. thomsonii*: 180, Juniper Hill, 4 Oct. 1955, large specimen with cap with conspicuous veins and striate margin; 181, Middle Marsh, Wheatfen, 18 July 1956, small specimen with smooth cap and striate cap margin; 182, Surlingham Wood, 20 July 1956, small specimen with veined cap; 183, Bindon Landslip, 29 Nov. 1958, section of specimen with depressed cap. (All × 1, except Fig. 172.)

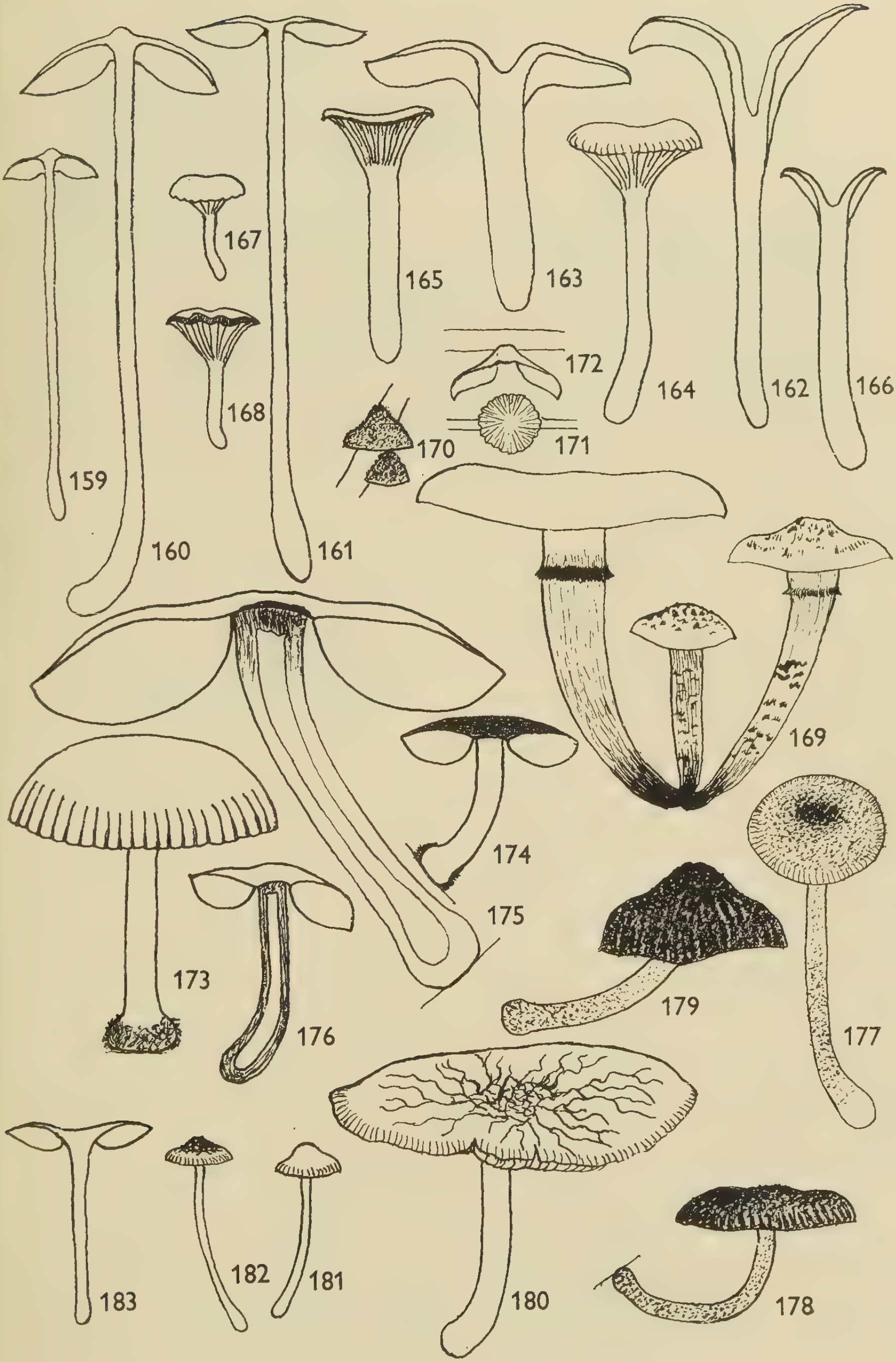
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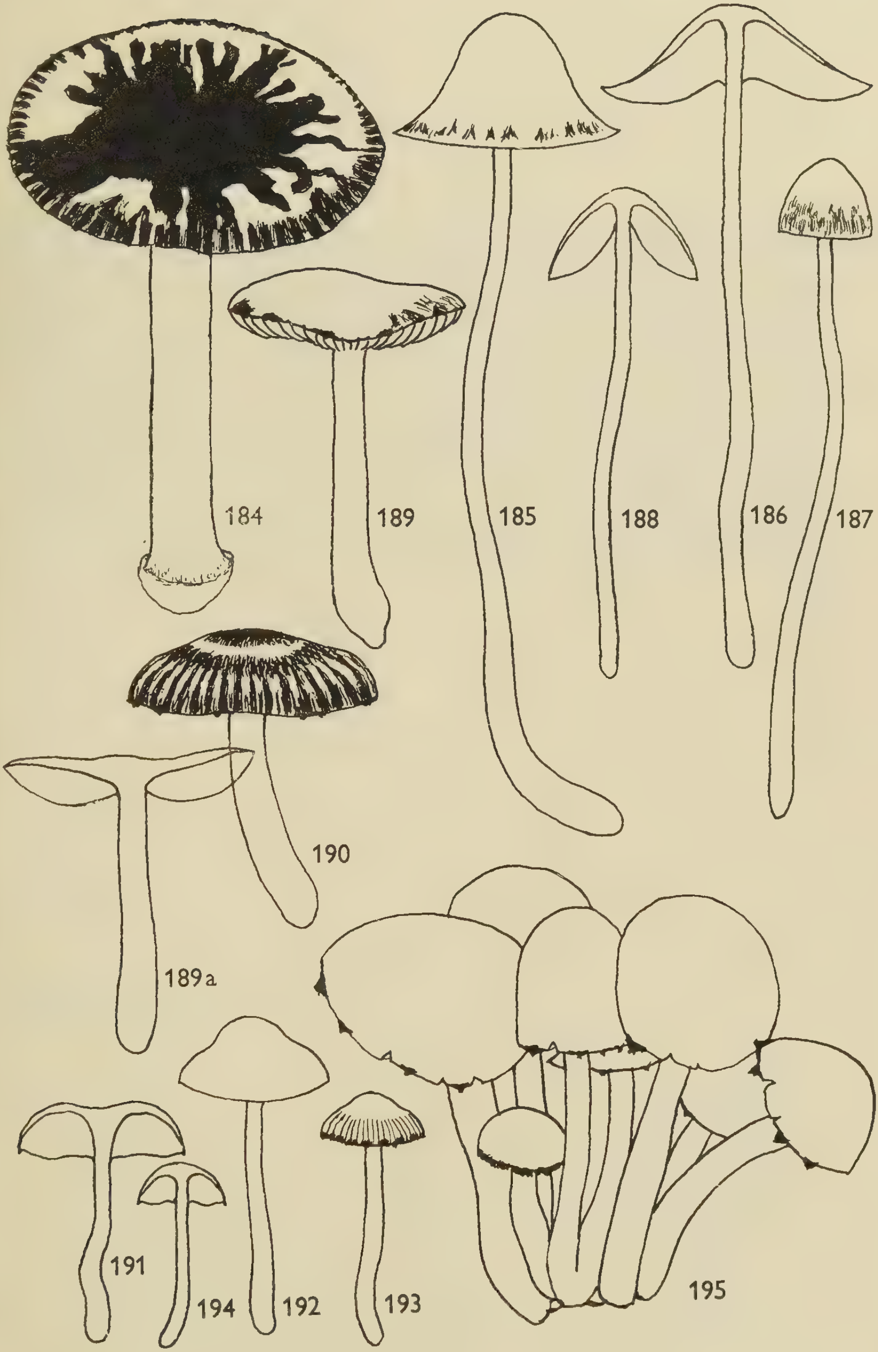
Fig. 184. *Pluteus murinus*, Druid's Grove, Norbury Park, 17 Oct. 1953, specimen with cap cuticle disrupted showing white flesh and a falsely striate-sulcate margin. Figs. 185–188. *Psathyrella badiovestita*: 185, 186, Bear Wood, Wokingham, 11 Oct. 1955, showing remains of fibrillose veil near cap margin; 187, 188, School Wood, Lucton, 27 Oct. 1959, showing fibrils on cap. Figs. 189, 189*a*, 190. *P. cortinarioides*: 189, 189*a*, Surlingham Wood, 18 Oct. 1957, showing remains of veil at edge of cap; 190, Allerford Wood, 8 Nov. 1959, showing half-dry cap with paler radial streaks and slightly darker cap centre. Figs. 191–194. *P. flexispora*, Studland: 191, 192, 29 Oct. 1952 (del. T. J. Wallace); 193, 194, 17 Nov. 1958, showing striate cap with veil at margin. Fig. 195. *P. gordonii*, Burnham Beeches, 23 Oct. 1955, part of clump showing specimens with white appendiculate veil forming scales at cap margin and one young specimen with veil all round margin. (All × 1.)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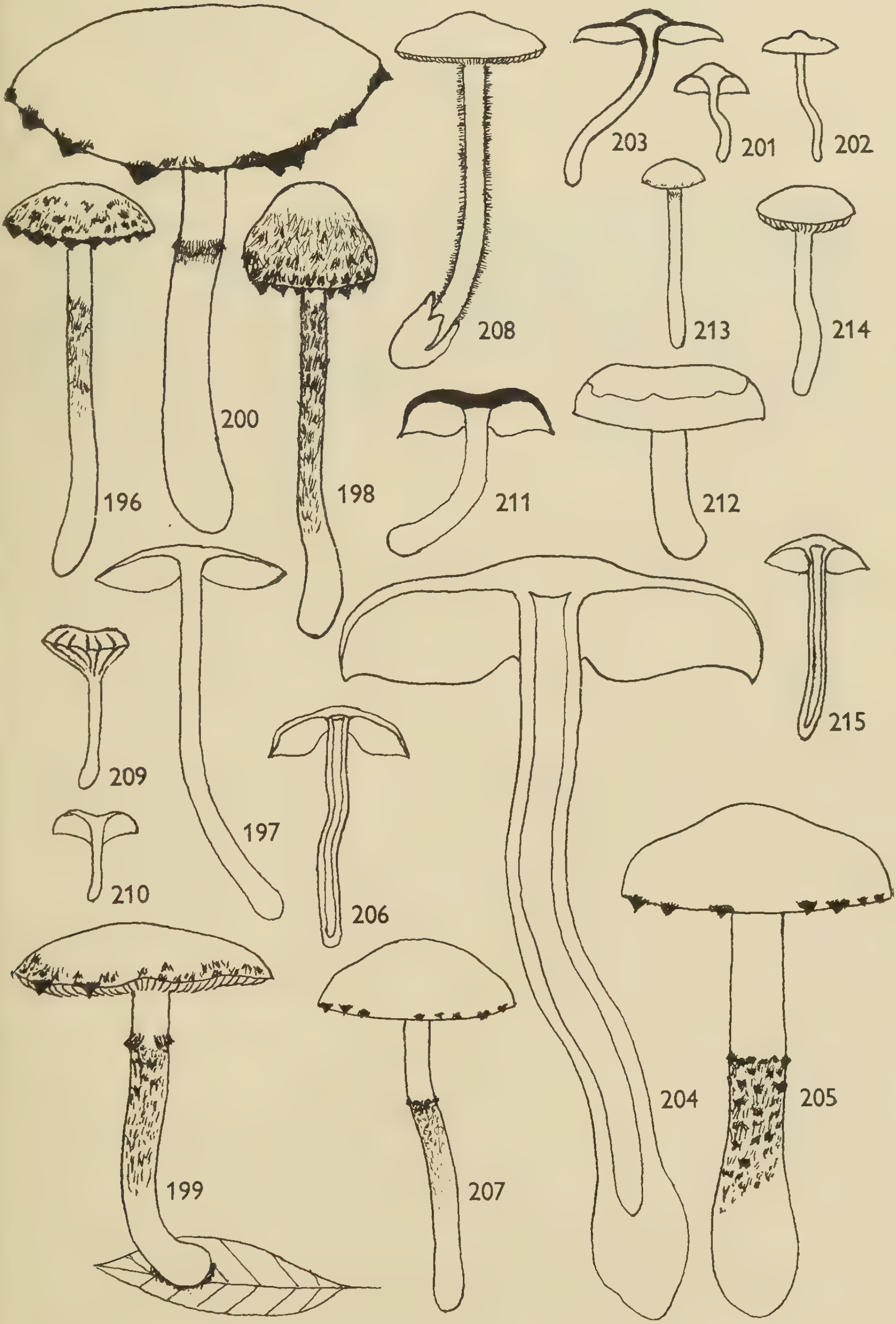
Figs. 196–198. *Psathyrella microlepidota*, Wheatfen: 196, 197, Thack Marsh, 24 July 1957, specimen with white fibrillose veil forming scales on cap and upper part of stem; 198, Parish Marsh, 8 July 1958, younger specimen with veil practically covering cap and stem. Fig. 199. *P. spintrigeroides*, Mountain Wood, East Horsley, 5 Nov. 1955, specimen attached to beech leaf, white veil at edge of cap and on stem and with incomplete striate ring. Fig. 200. *P. xanthocystis*, Glen Affric, 6 Sept. 1957, specimen with white veil on cap margin and forming ring-zone on stem. Figs. 201–203. *Rhodocybe melleopallens*, Druid's Grove, Norbury Park: 201, 202, 13 Oct. 1958; 203, 18 Oct. 1958, larger specimen showing darker flesh over gills and in stem apex. Figs. 204–207, *Stropharia aurantiaca*, Bossington: 204, 205, 30 Oct. 1957, specimen with white veil forming scales at cap edge and on stem and section of larger specimen; 206, 23 Nov. 1957; 207, 7 Nov. 1959, wiht white scales on cap and scales and fibrils on stem. Fig. 208. *Volvariella pubescentipes*, Druid's Grove, Norbury Park, 13 Oct. 1956, showing minutely downy pubescent stem. Figs. 209, 210. *Eccilia nigella*, Dawlish Warren, 12 Dec. 1956, showing striate cap. Figs. 211, 212. *Naucoria sumptuosa*, Allerford Wood, 7 Nov. 1959, showing darker flesh in moist cap and half-dry specimen with darker marginal zone. Figs. 213–215. *N. stagninoides*, Mid Yell, 23 July 1958: 213, young specimen with veil traces on cap edge and stem apex. (All × 1.)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Figs. 216, 217. *Flocculina fusispora*, Surlingham Wood, 11 Oct. 1957, on fragment of oak leaf: 217, × 3, showing furfuraceous cap and silky floccose stem. Figs. 218–220. *Naucoria celluloderma*: 218, 219, Parish Marsh, Wheatfen, 1 Oct. 1958, showing striate cap; 220, Shobdon, 31 Oct. 1959. Figs. 221–224. *N. cephalescens*, Dawlish Warren, 29 Oct. 1955, showing striate cap. Figs. 225–228. *N. permixta*: 225–227, Elstead, 13 Oct. 1955, showing striate cap; 228, Studland, 27 Oct. 1955, attached to *Salix* leaf and with traces of veil half-way down stem. Figs. 229–232. *N. salicis*, Thack Marsh, Wheatfen: 229–231, 17 July 1956, showing striate cap; 232, 5 Sept. 1959, young specimen with traces of veil on cap margin and at stem apex. Figs. 233–235. *N. striatula*, Parish Marsh, Wheatfen: 233, 234, 1 Oct. 1958, showing striate cap; 235, 1 Oct. 1958, large dry specimen with pale cap and dark stem. (All × 1, except Fig. 217.)

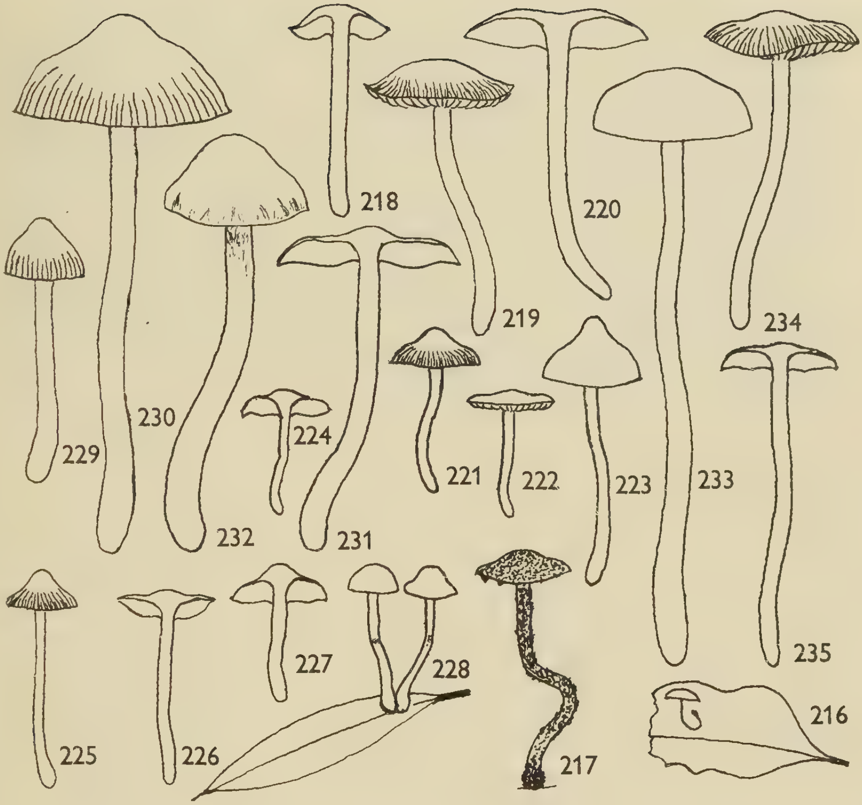
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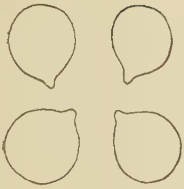
Fig. 236. *Amanita nivalis*, Ben Macdhui (type area), Inverness-shire, 7 Sept. 1955 (coll. M. D. Poore). Fig. 237. *A. vaginata* var. *alba*, Tomich, Inverness-shire, 6 Sept. 1957. Fig. 238. *Armillaria haematites*, type material, Glamis, Perthshire, Nov. 1876. Fig. 239. *Claudopus depluens*, Wood End, 18 July 1957 (coll. R. Watling). Fig. 240. *C. byssisedus*, Milton, Northants, 21 Oct. 1837 (ex Herb. Berk. as *C. depluens*). Fig. 241. *Clitocybe incomis*: *a*, Witley Common, Surrey, 1 Nov. 1945 (coll. A. A. Pearson as *Collybia clusilis*); *b*, Covenhope, 22 Nov. 1959. Fig. 242. *Clitopilus hobsonii*: *a*, type material, Apethorpe, Northants, Sept. 1859; *b*, Norbury Park, 5 Oct. 1955 (dotted lines show position of longitudinal ribs, central row of spores are as seen end on). Fig. 243. *Collybia* (Tephr.) *confusa*, Covenhope, 12 Dec. 1959. Fig. 244. *Conocybe dunensis*, Dawlish Warren, 26 Nov. 1955 (del. T. J. Wallace). Fig. 245. *C. percincta*, Wretham Meres, 2 Oct. 1958. Fig. 246. *C. vexans*, Guisachan, 1 Sept. 1957. Fig. 247. *Coprinus cinereofloccosus*, Rothamsted, 8 Nov. 1958, showing perisporial sac. Fig. 248. *C. ellisii*, Osier Carr, 9 July 1958. Fig. 249. *C. hendersonii* type material, King's Cliffe, Northants, 1860. Fig. 250. *C. saccharomyces*, Carnwath, 28 Sept. 1958 (central spore shows traces of perisporial sac). Fig. 251. *C. urticicola*: *a*, type material, King's Cliffe, 18 Aug. 1858; *b*, Bookham Common, Surrey, 21 June 1956. Fig. 252. *Cortinarius* (Phleg.) *balteatocumatilis*, Lochan Mhor, 14 Sept. 1957. Fig. 253. *C.* (P.) *violaceocinctus*, Rothiemurchus, 5 Sept. 1958. (All × 1000.)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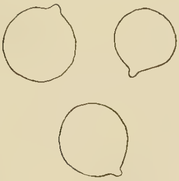
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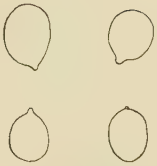
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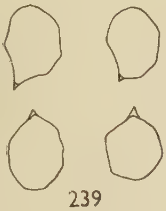
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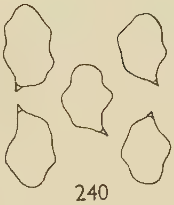
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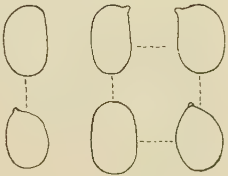

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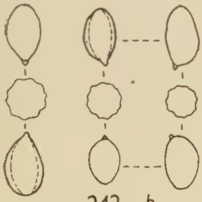

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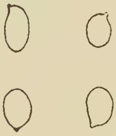
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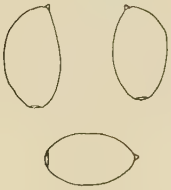
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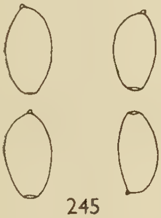
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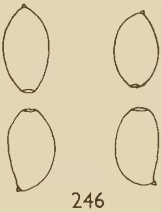
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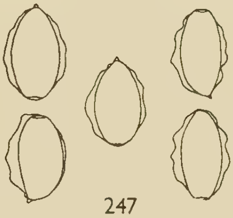
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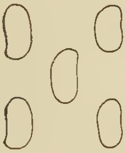
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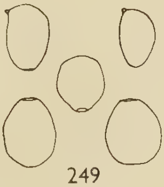
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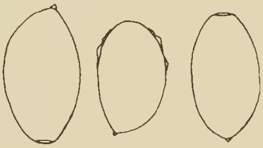
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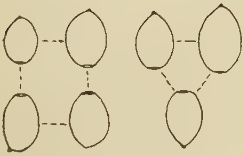

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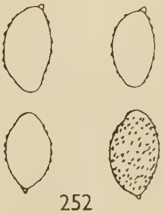
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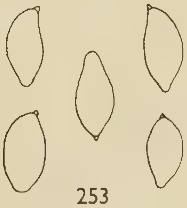
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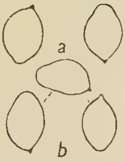
Fig. 254*a*, *b*. *Crepidotus amygdalosporus*, Wheatfen Carr, Surlingham, Norfolk: *a*, 18 July; *b*, 20 July 1956. Fig. 255. *C. autochthonus*, Norbury Park, Mickleham, Surrey, 5 Oct. 1955. Fig. 256. *C. cesatii*, Surlingham Wood, 18 Oct. 1957. Fig. 257. *C. inhonestus*: *a*, type material, Walkjärvi, Finland, Sept. 1885; *b*, Bindon Landslip, Rousdon, Devon, 29 Nov. 1958. Fig. 258. *C. applanatus*, Pollanbuidhe, Glen Affric, Inverness-shire, 21 Aug. 1955. Fig. 259. *C. subsphaerosporus*, Loch Craiglush, Dunkeld, Perthshire. Fig. 260. *C. subtilis*, Whitlands Landslip, 26 Nov. 1958. Fig. 261. *C. pubescens*: *a*, Elstead, Surrey, 9 Oct. 1954; *b*, Ballochallan, Perthshire, 28 Sept. 1957. Fig. 262. *C. variabilis*, Bear Wood, Wokingham, Berks, 11 Oct. 1955. Fig. 263. *C. lundellii*, type material, *Fungi Exsicc. Suec.* no. 220 (in British Museum, Nat. Hist.). Fig. 264. *C. luteolus*: *a*, Bossington, Som., 23 May 1957; *b*, Surlingham Wood, 20 Oct. 1956. Fig. 265. *C. herbarum*, Netley Heath, Gomshall, Surrey, 16 Nov. 1953. Fig. 266. *Eccilia nigella*, Dawlish Warren, 12 Dec. 1956. Fig. 267. *E. rusticoides*, Berrow, Som., 27 Oct. 1954 (coll. T. J. Wallace). Fig. 268. *E. turbidum*, Dawlish Warren, 29 Oct. 1955. Fig. 269. *E. fuscomarginatum*: *a*, Tomich, 24 Sept. 1958; *b*, West Sandwick, 3 Sept. 1952. Fig. 270. *E. majaloides*, Loch-an-Eilean, 8 Sept. 1957. Fig. 271. *Flocculina fusispora*: *a*, Surlingham, 11 Oct. 1957; *b*, Kingthorpe, 14 Sept. 1959. (All × 1000.)



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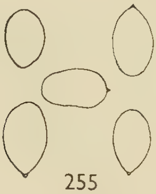

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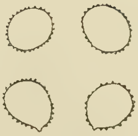

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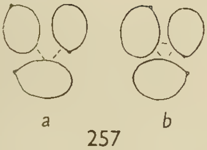

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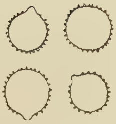

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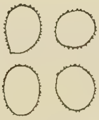

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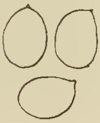

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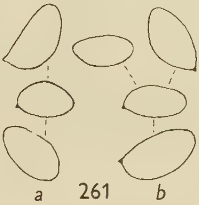

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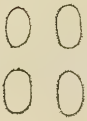

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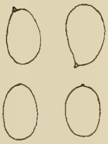

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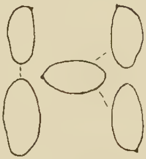

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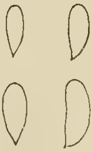

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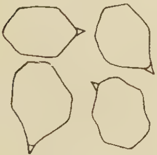

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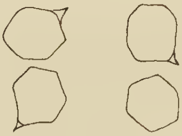

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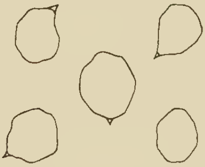

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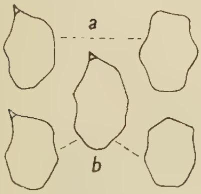

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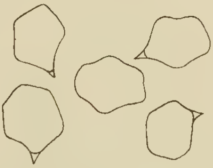

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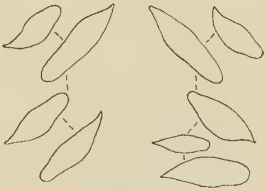

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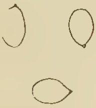
Fig. 272. *Flocculina pusillima*, Clapham Wood, 27 Aug. 1958. Fig. 273. *Galerina ampullaceocystis*, Tomich, 15 July 1958. Fig. 274. *G. calyptrata*, Plym Valley, 29 Aug. 1956 (some spores with remains of perispore). Fig. 275. *G. cinctula*, Surlingham Wood, 20 Oct. 1956. Fig. 276. *G. embolus*: *a*, Dawlish Warren, 12 Dec. 1956; *b*, Braunton Burrows, 29 Oct. 1950. Fig. 277. *G. luteofulva*, Newby Head, 16 Sept. 1953. Fig. 278. *G. praticola*: *a*, North Bull Island, 31 Oct. 1950 (coll. F. C. Hassell, det. A. A. Pearson as *Pholiota pumila* var. *subferruginea*); *b*, Freshfield, 13 Nov. 1958 (lower central and lower left-hand spores in optic. sect.). Fig. 279. *G. salicicola*, Epsom Common, 4 Oct. 1952 (central spore in optic. sect.). Fig. 280. *Gymnopilus decipiens*: *a*, type material, Epping Forest, 19 June 1869; *b*, Black Pond, Esher, Surrey, 15 Oct. 1954. Fig. 281. *Hygrophorus* (Camarophyllus) *berkeleyi*, Membury, 25 Oct. 1957. Fig. 282. *H.* (Hygrocybe) *aurantiosplendens*, Membury, 5 Nov. 1956. Fig. 283. *H.* (H.) *coccineocrenatus*, Studland, 23 July 1952 (del. T. J. Wallace). Fig. 284. *H.* (H.) *coccineus*, Membury, 5 Nov. 1956. Fig. 285. *H.* (H.) *splendidissimus*: *a*, Tomich, 28 Aug. 1957; *b*, 29 Oct. 1957. Fig. 286. *H.* (H.) *turundus*, Rothiemurchus, 28 Aug. 1955. Fig. 287. *H.* (H.) *conicoides*, Bossington, 30 Oct. 1957. Fig. 288. *H.* (H.) *olivaceoniger*, Holkham, 6 Oct. 1958. Fig. 289. *H.* (H.) *xanthochrous*, Rothiemurchus, 16 Sept. 1957. (All × 1000.)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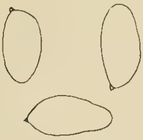
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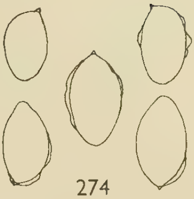
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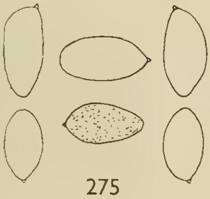
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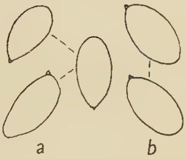

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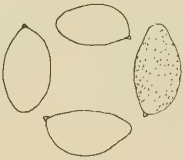
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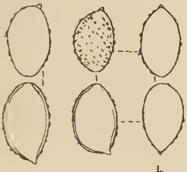

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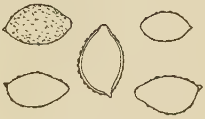
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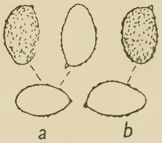

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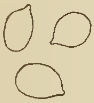
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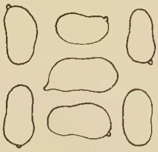
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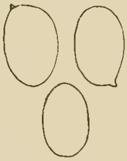
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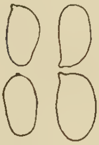
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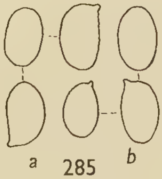

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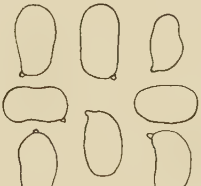
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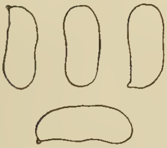
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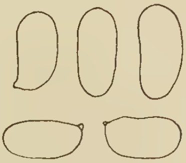
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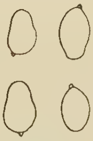
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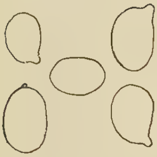
Fig. 290. *Hygrophorus* (Hygrocybe) *chlorophanus*, Epsom Downs, Surrey, 3 Nov. 1954. Fig. 291. *H.* (H.) *flavescens*, Kinlochrannoch, Perthshire, 27 Aug. 1954. Fig. 292. *H.* (H.) *konradii*, Ashurst Valley, Boxhill, Surrey, 2 July 1955. Fig. 293. *H.* (H.) *marchii*, Plodda, Guisachan, Inverness-shire, 14 Sept. 1956. Fig. 294. *H.* (H.) *subminutulus*, Membury, 4 Nov. 1956. Fig. 295. *H.* (H.) *subglobisporus*, Mickleham Downs, 18 Oct. 1958. Fig. 296. *H.* (H.) *strangulatus*: *a*, Studland, 29 Oct. 1956; *b*, Holt Lowes, 5 Oct. 1958. Fig. 297. *H.* (H.) *substrangulatus*, Studland, 17 Nov. 1958. Fig. 298. *H.* (H.) *langei*, Burrator, Devon, 30 Aug. 1956. Fig. 299. *H.* (H.) *reai*, Hackhurst Downs, Gomshall, Surrey, 24 Oct. 1954. Fig. 300. *Hypholoma ericaeoides*, Shobdon, 24 Oct. 1959. Fig. 301. *H. ericaeum*, Studland, Dorset, 17 Nov. 1958. Fig. 302. *H. subericaea*, Downwood, Shobdon, Herefordshire, 24 Oct. 1959. Fig. 303. *H. elongatum*, Oxshott Heath, Surrey, 21 Oct. 1951. Fig. 304. *H. udum*, Pollanbuidhe, Glen Affric, Inverness-shire, 21 Aug. 1955. Fig. 305. *Inocybe* (Inocybe) *obscuroides*, Malham, 31 Aug. 1958. Fig. 306. *I.* (Clypeus) *dunensis*, Freshfield, 9 July 1956. Fig. 307. *I.* (C.) *glabrodisca*, Malham, 1 Sept. 1958. (All × 1000.)



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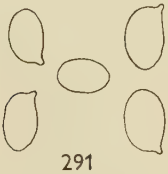

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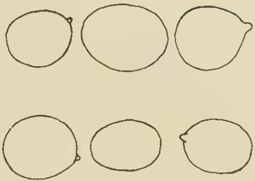

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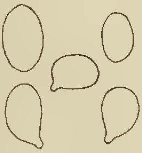

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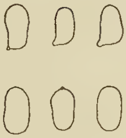

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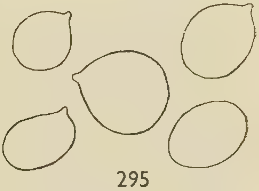

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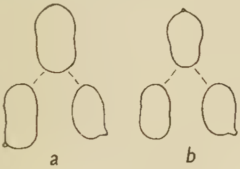

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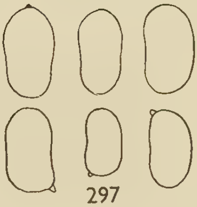

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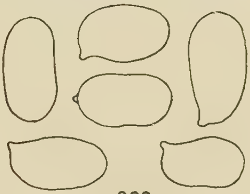

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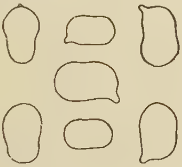

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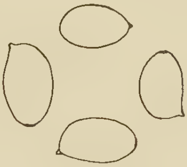

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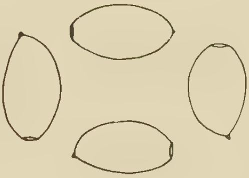

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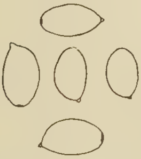

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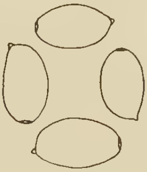

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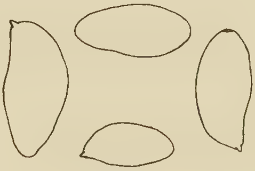

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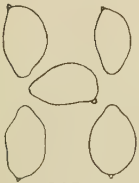

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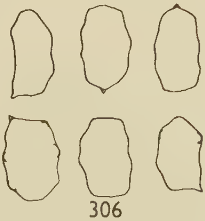

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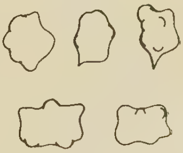

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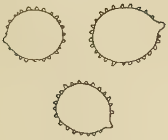
Fig. 308. *Laccaria bicolor*, Loch Rannoch, 27 Aug. 1954. Fig. 309. *L. striatula*, Shobdon, 31 Oct. 1959. Fig. 310. *L. tortilis*, Mortimer, Berks, 10 Sept. 1959. Fig. 311. *Lepiota badhamii*, type material, Apethorpe, Northants, Sept. 1852. Fig. 312. *L. brunneocingulata*, Park End, 24 Nov. 1958. Fig. 313. *L. ochraceofulva*, Mousewood Farm Wood, 8 Oct. 1958. Fig. 314. *L. tenera*, Surlingham, 18 Oct. 1957. Fig. 315. *Leptonia anatina*: *a*, Edzell, 1 Sept. 1950; *b*, Freshfield, 6 Sept. 1951. Fig. 316. *L. caerulea*, Freshfield, 6 Sept. 1951. Fig. 317. *L. cyaneoviridescens*, Tomich, 24 Sept. 1958. Fig. 318. *L. fulva*, Lower Tullochgrue, 27 Aug. 1955. Fig. 319. *L. indutoides*, Ingleton, 28 Aug. 1958. Fig. 320. *L. inocybeoides*, Dawlish Warren, 17 Nov. 1956. Fig. 321. *L. nigroviolacea*, Tomich, 27 Aug. 1957. Fig. 322. *L. pernitrosa*, Studland, 21 Nov. 1955. Fig. 323. *L. sarcitula*, Guisachan, 20 Aug. 1955. Fig. 324. *Mycena lactella*, Freshfield, 13 Nov. 1958. Fig. 325. *M. tortuosa*, Goodworthy Thicket, Membury, 24 Oct. 1957. (All × 1000.)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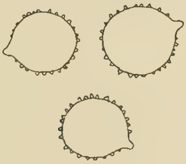
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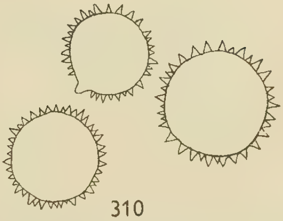
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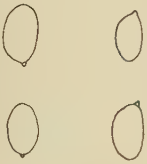
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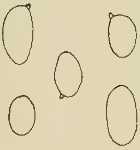
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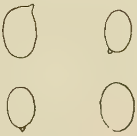
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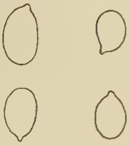
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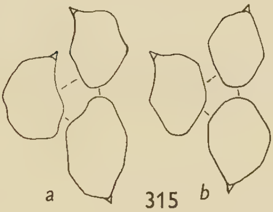

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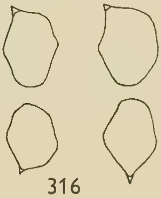
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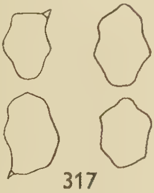
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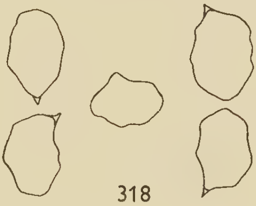
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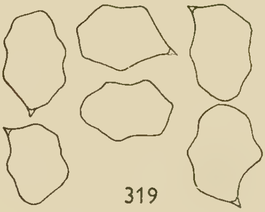
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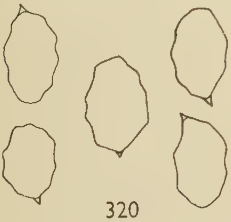
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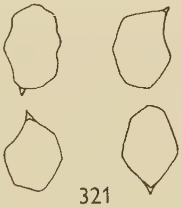
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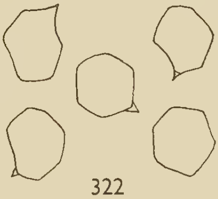
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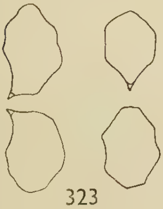
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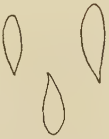
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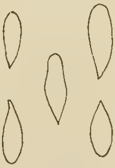
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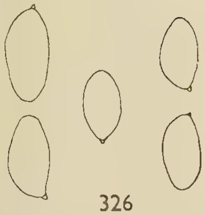
Fig. 326. *Naucoria cephalescens*, Dawlish Warren, 29 Oct. 1955. Fig. 327. *N. permixta*, Elstead, 13 Oct. 1955. Fig. 328. *N. salicis*: *a*, Epsom Common, 10 Oct. 1952; *b*, Thack Marsh, 5 Sept. 1959; *c*, Freshfield, 16 Sept. 1959. Fig. 329. *a*, *N. sphagneti*, Loch-an-Eilean, 29 Sept. 1955; *b*, *N. amarescens*, Headley, Surrey, 8 Oct. 1952. Fig. 330. *N. subconspersa*: *a*, Pollanbuidhe, Glen Affric, Inverness-shire, 21 Aug. 1955; *b*, Freshfield, 16 Sept. 1959. Fig. 331. *N. celluloderma*: *a*, Parish Marsh, 1 Oct. 1958; *b*, Kingthorpe, 14 Sept. 1959; *c*, Shobdon, 31 Oct. 1959. Fig. 332. *N. striatula*: *a*, Parish Marsh, 1 Oct. 1958; *b*, Ellerburn, Yorks, 13 Sept. 1959; *c*, Kingthorpe, 14 Sept. 1959. Fig. 333. *N. escharoides*, School Wood, Lucton, Herefordshire, 2 Nov. 1959. Fig. 334. *N. stagninoides*, Mid-Yell, 23 July 1958. Fig. 335. *Nolanea papillata*, Burrator, Devon, 30 Aug. 1956. Fig. 336. *Naucoria zetlandica*: *a*, Grimister, 25 July 1958; *b*, Shobdon, 31 Oct. 1959. Fig. 337. *N. stagnina*, Pollanbuidhe, Glen Affric, Inverness-shire, 21 Aug. 1955. Fig. 338. *Nolanea lucida*: *a*, Membury, 1 Nov. 1957; *b*, Clapham, 27 Aug. 1958. Fig. 339. *N. radiata*, Dawlish Warren, 27 Oct. 1956. Fig. 340. *N. sericea*, Trevone, Cornwall, 9 Nov. 1957. Fig. 341. *N. farinolens*: *a*, Badger Falls, 19 Aug. 1955; *b*, Guisachan, 20 Aug. 1955; *c*, Thack Marsh, 17 July 1956. Fig. 342. *N. tenella*, Studland, Dorset, 29 Oct. 1956. Fig. 343. *N. minuta*, Freshfield, 16 Sept. 1959. (All × 1000.)



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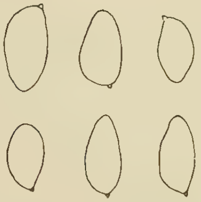

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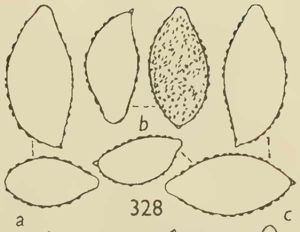

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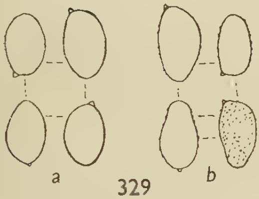

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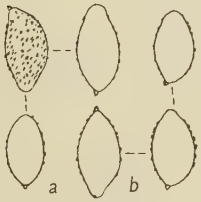

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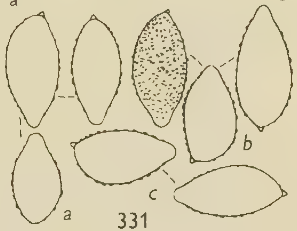

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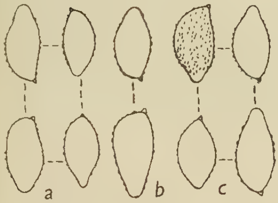

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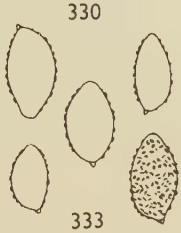

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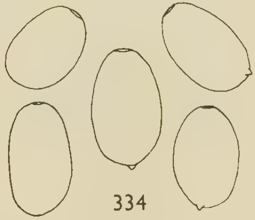

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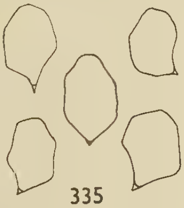

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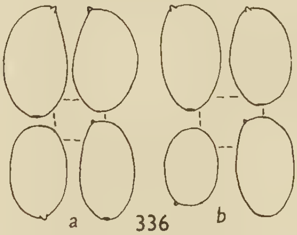

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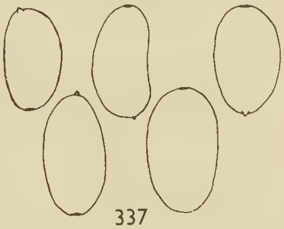

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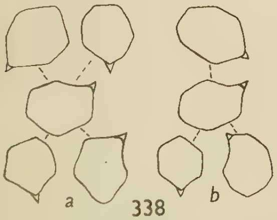

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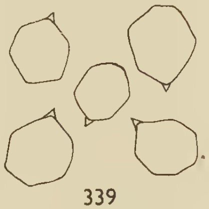

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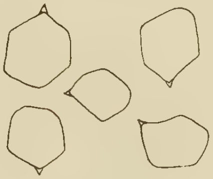

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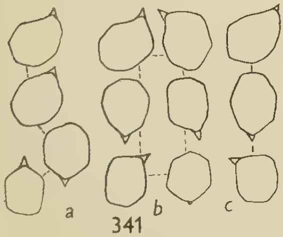

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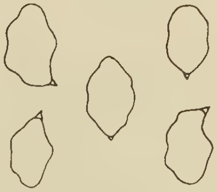

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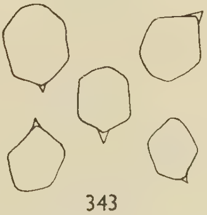

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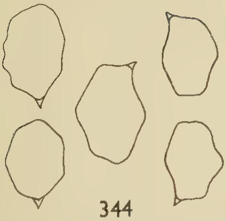
Fig. 344. *Nolanea hirtipes*, Holwell Wood, Som., 24 Nov. 1958. Fig. 345. *N. mammosa*, Epsom Downs, Surrey, 3 Nov. 1954. Fig. 346. *N. tenuipes*: *a*, Wheatfen Carr, 18 July 1956; *b*, Friston, 17 Nov. 1957. Fig. 347. *N. hebes*, Boxhill, Surrey, 15 Oct. 1948 (coll. A. A. Pearson). Fig. 348. *N. cuneata*, Witley Common, Surrey, 1 Nov. 1945 (coll. and det. A. A. Pearson). Fig. 349. *N. sericeonitens*, Dawlish Warren, 12 Dec. 1956 (coll. T. J. Wallace). Fig. 350. *Omphalina fusconigra*: *a*, Glenesk, 30 Aug. 1952; *b*, Blairdrummond, 28 Sept. 1957 (coll. J. Grainger). Fig. 351. *O. hepatica*, Dawlish Warren, 8 Dec. 1956 (coll. T. J. Wallace). Fig. 352. *O. pyxidata*, Dawlish Warren, 11 Nov. 1957. Fig. 353: *a*, *Pholiota aromatica*, Tomich, 5 Sept. 1957; *b*, Surrey, 26 Oct. 1952 and named *P. pseudohypholoma* by A. A. Pearson (coll. J. M. B. King). Fig. 354. *P. dissimulans*, type material, Hothorpe, no date. Fig. 355. *P. inaurata*, type material, North Wootton, Norfolk, no date. Fig. 356. *Pleurotellus patelloides*: *a*, Dowlands Landslip, 29 Nov. 1958; *b*, Bindon Landslip, 2 Dec. 1958. Fig. 357. *Psathyrella badiovestita*, Lucton, 27 Oct. 1959. Fig. 358. *P. semivestita*, type material, no data. Fig. 359. *P. cortinarioides*: *a*, Surlingham Wood, 18 Oct. 1957; *b*, Allerford Wood, 8 Nov. 1959. Fig. 360. *P. microlepidota*: *a*, Thack Marsh, 24 July 1957; *b*, Parish Marsh, 8 July 1958. Fig. 361. *P. egenula*, type material, 22 May 1860 (no locality). (All × 1000.)



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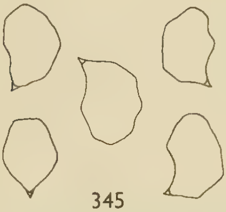

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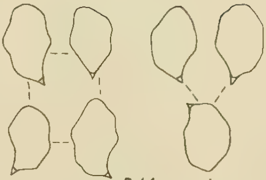

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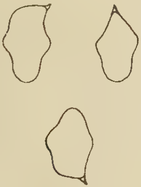

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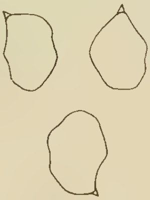

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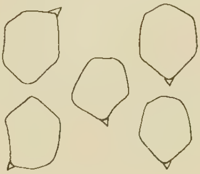

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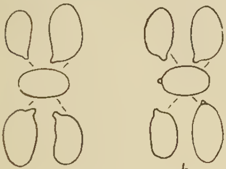

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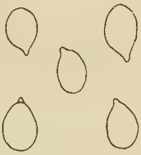

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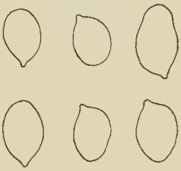

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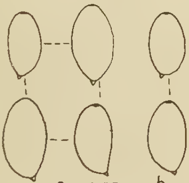

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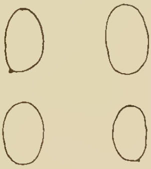

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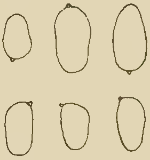

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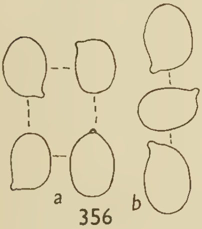

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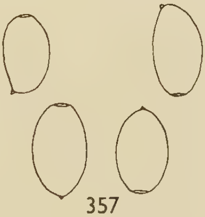

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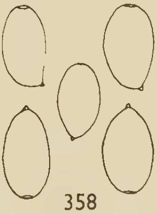

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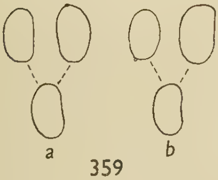

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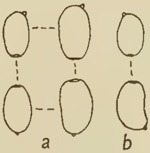

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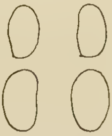

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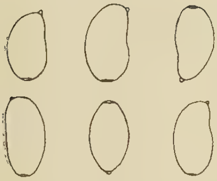
Fig. 362. *Psathyrella flexispora*, Studland, 17 Nov. 1958. Fig. 363. *P. clivensis*: *a*, type material, 2 Oct. 1860 (no locality); *b*, Epsom Downs, 17 Nov. 1951. Fig. 364. *P. vinosofulva*, Dowlands Landslip, 29 Nov. 1958. Fig. 365. *P. spintrigeroides*, Mountain Wood, 5 Nov. 1955. Fig. 366. *P. leucotephra*: *a*, type material, North Kilworth, Leics, 10 Oct. 1870; *b*, Gomshall, 23 Aug. 1958. Fig. 367. *P. gordonii*: *a*, type material, Orton Longueville, Hunts, 10 Oct. 1860; *b*, Burnham Beeches, 23 Oct. 1955; *c*, Bicester, Oxon, 4 Oct. 1949 (ex Herb. A. A. Pearson). Fig. 368. *P. jerdonii*, type material, Mossburnford, Roxburghshire, 2 Nov. 1860. Fig. 369. *P. xanthocystis*, Badger Falls, 6 Sept. 1957. Fig. 370. *P. chondroderma*, type material, Glamis Pine Wood, Perthshire, no date. Fig. 371. *P. empyreumatica*, type material, Sibbertoft, Northants, 28 Oct. 1870. Fig. 372. *Rhodocybe melleopallens*, Norbury Park, 14 Oct. 1958: *a*, in profile; *b*, end-on. Fig. 373. *R. nitellina*, Gomshall, Surrey, 22 Aug. 1958. Fig. 374. *Stropharia aurantiaca*, Bossington, 30 Oct. 1957. Fig. 375. *S. percevalii*: *a*, type material, Wallington, Northumberland, no date; *b*, from Northumberland material from which Cke 554 (550) was painted. Fig. 376. *Volvariella pubescentipes*, Norbury Park, 13 Oct. 1956 (coll. Miss M. L. Chalk). Fig. 377. *Conocybe utriformis*, Wheatfen Carr, 18 July 1956. Fig. 378. *Cortinarius* (Phlegmacium) *durus*, Rothiemurchus, 26 Sept. 1958. Fig. 379. *Dermoloma josserandii*, Higher Merridge, 15 Sept. 1958. (All × 1000.)



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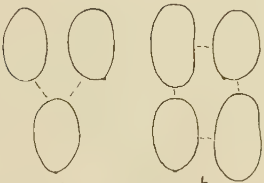
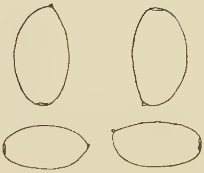


a 363 b



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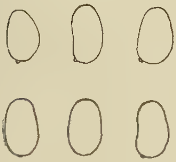

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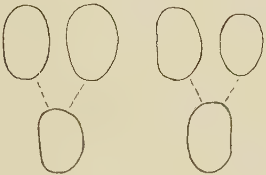

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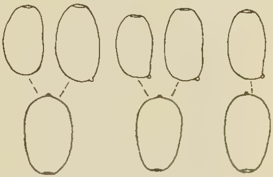
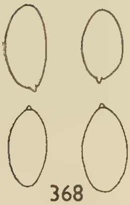


a 367 b c



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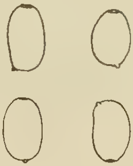

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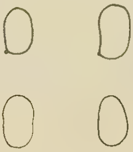

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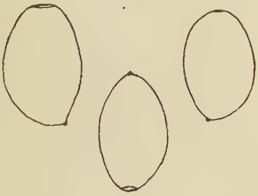

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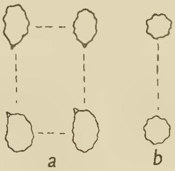

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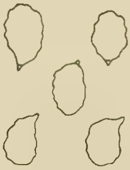

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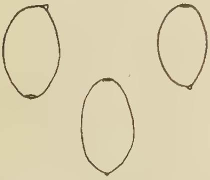

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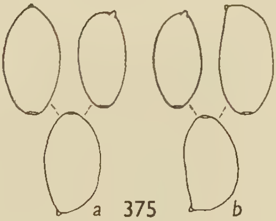
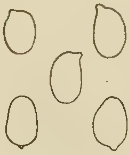


a 375 b



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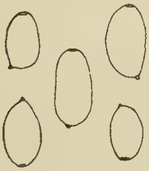

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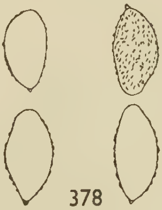

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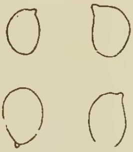

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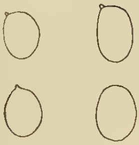
Fig. 380. *Crepidotus sambuci*, Whitlands Landslip, 26 Nov. 1958. Fig. 381. *C. wakefieldiae*, Cotterill Clough (type locality), Ches., 4 Jan. 1960 (coll. Miss B. Harthan). Fig. 382. *Cystoderma amianthinum*, Billy Down, Membury, Devon, 2 Nov. 1957. Fig. 383. *Deconica muscorum*, Studland, 17 Nov. 1958. Fig. 384: *a*, *Agaricus* (Psilocybe) *physaloides* in Herb. Berk., Croydon, Sept. 1852; *b*, *D.* taxonomic sp. 1, Epsom College, 21 Nov. 1951. Fig. 385. *Cystoderma simulatum*, Surlingham Wood, 12 Oct. 1957. Fig. 386: *a*, *Deconica bullacea*, Wretham Meres, Norfolk, 2 Oct. 1958; *b*, *D.* taxonomic sp. 2, Mid-Yell, Shetlands, 23 July 1958. Fig. 387. *Eccilia paludicola*, Amberley, 25 May 1959 (coll. D. A. Reid). Fig. 388. *Hygrophorus* (Hygrophorus) *mesotephrus*: *a*, type material, Bowood, 19 Oct. 1853; *b*, Lyndhurst Road, 19 Nov. 1958. Fig. 389. *H.* (Hygrocybe) *nitiosus*, Plodda, Guisachan, Inverness-shire, 19 Sept. 1958. Fig. 390. *H.* (H.) *nitratus*, Membury, Devon, 25 Oct. 1957. Fig. 391. *H.* (H.) *ovinus*, Membury, Devon, 25 Oct. 1957. Fig. 392. *H.* (H.) *schulzeri*, Membury, 2 Nov. 1957. Fig. 393. *Inocybe* (Inocybe) *devoniensis*, Braunton Burrows, 3 Oct. 1951 (del. T. J. Wallace). Fig. 394. *I.* (I.) *xanthocephala*, Holwell Wood, 21 Nov. 1957. Fig. 395. *I.* (Clypeus) *striatorimosa*, Hindhead, 23 Sept. 1942 (coll. A. A. Pearson as *I. striata*). Fig. 396. *Lepiota rosea*, Langcliffe Brow, 22 Sept. 1957. Fig. 397. *Naucoria sumptuosa*: *a*, Juniper Hill, 12 Oct. 1952; *b*, Allerford Wood, 7 Nov. 1959. (All × 1000.)



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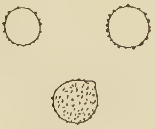

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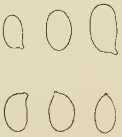

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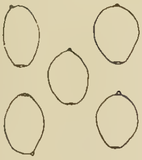

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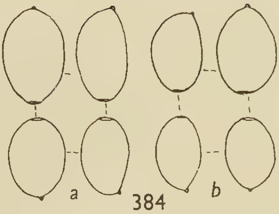

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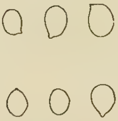

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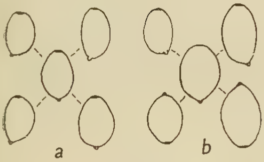

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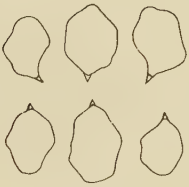

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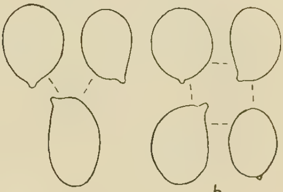

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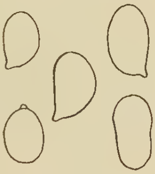

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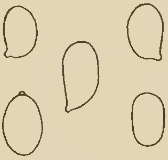

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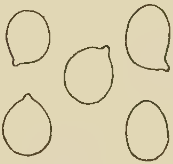

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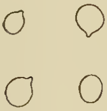

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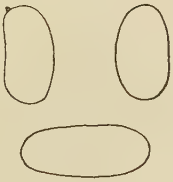

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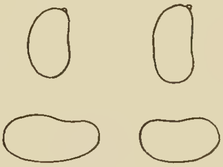

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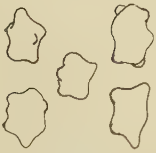

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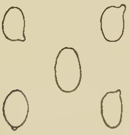

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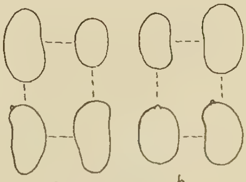

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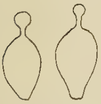
Figs. 398–402. Marginal cystidia: 398, *Conocybe dunensis*, Dawlish Warren, 26 Nov. 1955 (del. T. J. Wallace); 399, *C. magnicapitata*, Gwydyr Forest, 16 May 1958; 400, *C. percincta*: *a*, Wretham Meres, 2 Oct. 1958; *b*, Covenhope, 21 Nov. 1959; 401, *C. utriformis*, Wheatfen Carr, 19 July 1956; 402, *C. vexans*, Tomich: *a*, 1 Sept. 1957; *b*, 19 Sept. 1958. Figs. 403, 404. *Coprinus cinereofloccosus*, Rothamsted, 8 Nov. 1958; 403, minutely warty cells of veil on cap; 404, minutely warty bladder-shaped cells from flocci at stem base. Figs. 405, 406. *C. ellisii*, Osier Carr, 17 July 1958, cells from veil on cap: 405, globose, smooth, thin-walled cell; 406, part of chain of thick-walled, sometimes encrusted cells. Fig. 407. *Eccilia paludicola*, cells from cap surface containing black-brown pigment masses, Amberley, 25 May 1959. Figs. 408, 409. *Flocculina fusispora*, Surlingham Wood, 11 Oct. 1957: 408, marginal cystidia; 409, encrusted cells from veil on cap. Figs. 410–414. Marginal cystidia: 410, *Galerina calyptrata*, Plym Valley, 29 Aug. 1956; 411, *Entoloma fusco-marginatum*, Tomich, 18 Sept. 1958; 412, *G. ampullaceocystis*, Tomich, 15 July 1958; 413, *G. cinctula*: *a*, Glen Einich, 29 Aug. 1955; *b*, Mousewood Farm Wood, 10 July 1958; 414, *G. luteofulva*, Mortimer, 26 Oct. 1954. Fig. 415. *G. salicicola*, Epsom Common: *a*, marginal cystidia, 1 Oct. 1952; *b*, marginal cystidia, 4 Oct. 1955; *c*, facial cystidia, 4 Oct. 1955. Fig. 416. *G. embolus*, marginal cystidia (del. T. J. Wallace), Dawlish Warren, 19 Dec. 1956. (All × 500.)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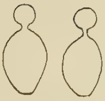
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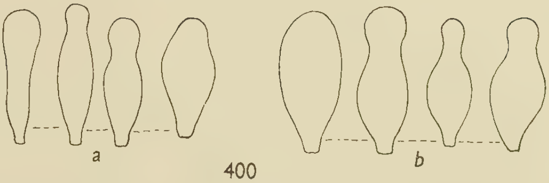

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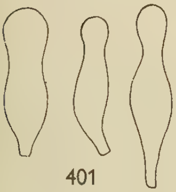
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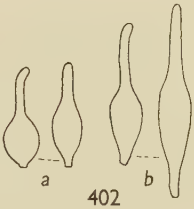

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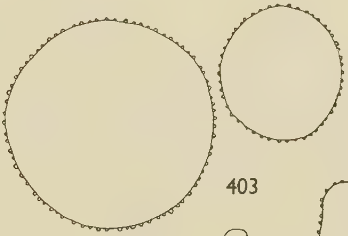
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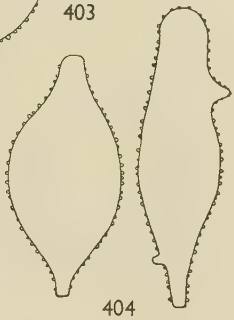
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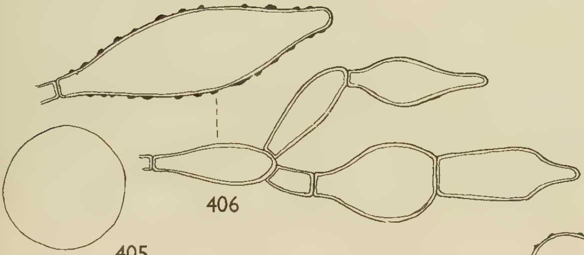
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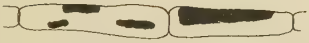
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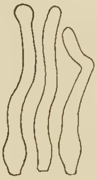
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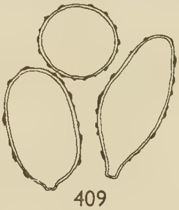
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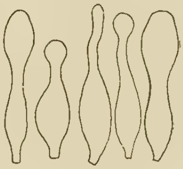
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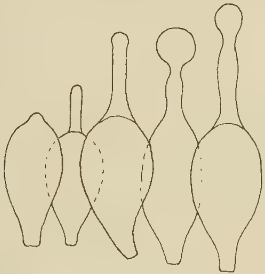
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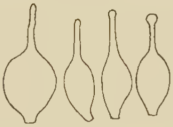
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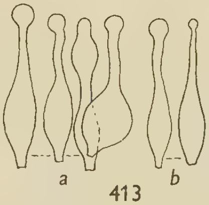

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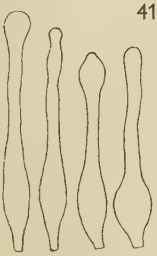
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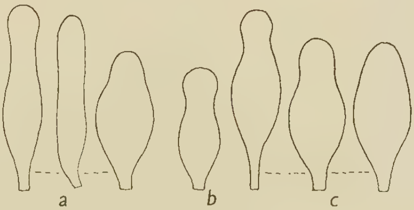

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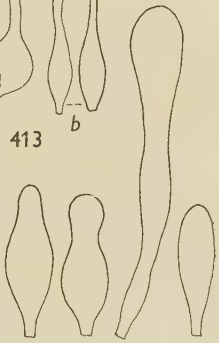
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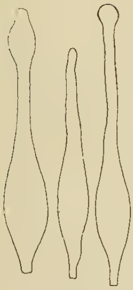
Figs. 417–423. Cystidia: 417, *Galerina praticola*, marginal, Park Wood, 31 Oct. 1951; 418, 419, *Inocybe* (Inocybe) *devoniensis*, Braunton Burrows (del. T. J. Wallace); 418, marginal, 20 Oct. 1953; 419, facial, 21 Nov. 1956; 420, *I.* (I.) *obscuroides*, facial, Malham, 31 Aug. 1958; 421, *I.* (I.) *xanthocephala*, marginal, Holwell Wood, 21 Nov. 1957; 422, *I.* (Clypeus) *dunensis*, facial, Freshfield, 9 July 1956; 423, *I.* (C.) *glabrodisca*, facial, Malham, 1 Sept. 1958. Figs. 424, 425. *Lepiota rosea*, Langcliffe Brow, 22 Sept. 1957: 424, marginal cystidia; 425, cells of veil on cap. Figs. 426, 427. *L. brunneocingulata*: 426, marginal cystidia: *a*, Kenley Bottom, 24 Nov. 1958; *b*, Bindon Landslip, 29 Nov. 1958; 427, end-cells of scales on cap (×250), Kenley Bottom, 24 Nov. 1958. Figs. 428–430. *L. ochraceofulva*, Mousewood Farm Wood, 8 Oct. 1958: 428, marginal cystidia; 429, cells of cap surface from above; 430, cells of cap surface in a vertical section. Fig. 431. *Leptonia inocybeoides*, cells of scales on cap containing black-brown pigment masses. Figs. 432, 433. *L. indutoides*, Ingleton, 28 Aug. 1958: 432, cell from cap surface with black-brown pigment mass; 433, marginal cystidia. Fig. 434. *Marasmius saccharinus*, marginal cystidia, Boxhill, 19 Nov. 1954. Figs. 435, 436. *Lepiota tenera*, Surlingham Wood, 18 Oct. 1957: 435, marginal cystidia; 436, cells from cap scales, one with dark brown pigment body (shown black). Fig. 437. *Marasmius torquescens*, thick-walled cell from cap surface, Juniper Hill, 5 Oct. 1952. Fig. 438. *Mycena belliae*, marginal cystidia, Thack Marsh, 21 Oct. 1956. Fig. 439. *M. angustispora*, hyaline thick-walled cells from cap surface, Mickleham Downs, 24 Nov. 1953. Figs. 440, 441. *M. lactella*, Freshfield, 13 Nov. 1958: 440, marginal cystidia; 441, cells on stem (*a*) and cap surface (*b*). (All ×500, except Fig. 427.)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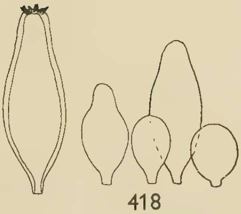
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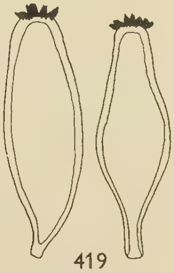
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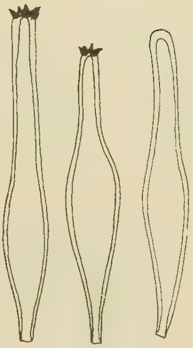
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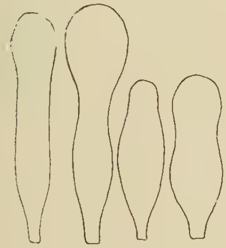
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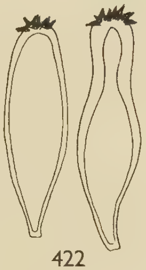
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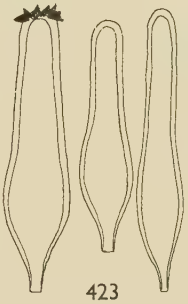
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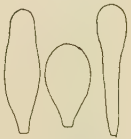
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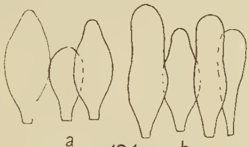

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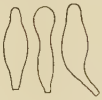
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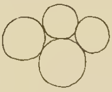
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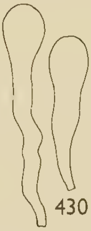
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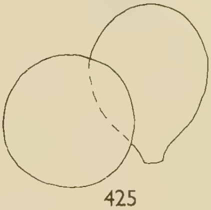
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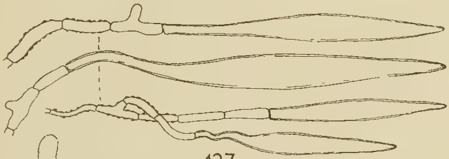
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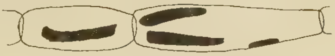
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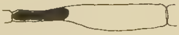
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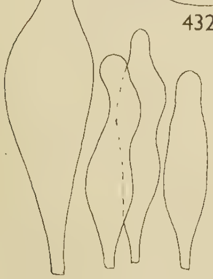
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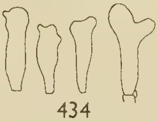
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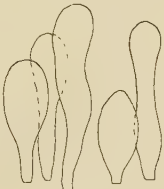
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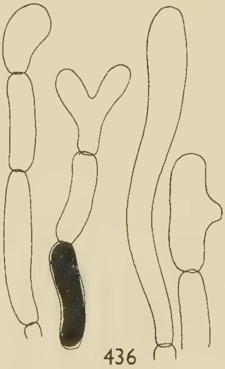
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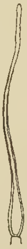
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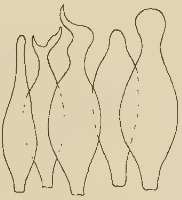
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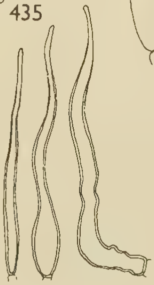
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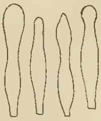
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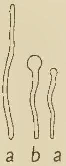

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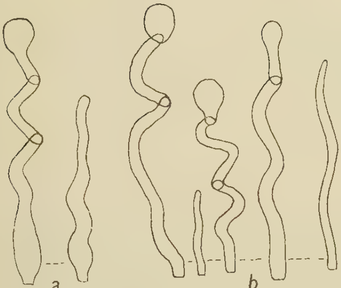
Figs. 442–444. *Mycena tortuosa*: 442, cells of pruina on stem: *a*, Godworthy Thicket, 1 Nov. 1956; *b*, Holwell Wood, 21 Nov. 1957; 443, marginal cystidia, Godworthy Thicket, 1 Nov. 1956; 444, cells on cap surface: *a*, part of group of capitate cells, Godworthy material; *b*, Holwell material. Fig. 445. *Naucoria bohemica*, marginal cystidia: *a*, Little Brechin, Angus, 13 Sept. 1958; *b*, Wheatfen Carr, Surlingham, Norfolk, 10 Oct. 1957. Figs. 446–448. *N. salicis*, Thack Marsh: 446, vertical section of cap surface near centre, cap beginning to expand, 5 Sept. 1959; 447, same, from above; 448, marginal cystidia: *a*, 17 July 1956, mature specimen; *b*, 5 Sept. 1959, younger specimen. Figs. 449, 450. *N. celluloderma*, Parish Marsh, 1 Oct. 1958: 449, marginal cystidia; 450, cells in vertical section of cap surface. Fig. 451. *N. permixta*, marginal cystidia: *a*, Elstead, 13 Oct. 1955; *b*, Studland, 27 Oct. 1955. Figs. 452, 453. *N. cephalescens*, Dawlish Warren, 29 Oct. 1955 (del. T. J. Wallace): 452, cap surface from above (heterocellular); 453, marginal cystidia. Fig. 454. *Nolanea tenuipes*, marginal cystidia, Mickleham Downs: *a*, 1 Oct. 1954, *b*, 6 Oct. 1955. Fig. 455. *Omphalina hepatica*, cells of pruina on stem (del. T. J. Wallace), Dawlish Warren, 8 Dec. 1956. Figs. 456, 457. *Naucoria sphagneti*, Loch-an-Eilean, 27 Sept. 1955: 456, part of chain of cells from cap scales (end-cell on right); 457, marginal cystidia. Fig. 458. *N. zetlandica*, marginal cystidia: *a*, Covenhope, 24 (a^1) and 31 (a^2) Nov. 1959; *b*, Grimister, 25 July 1958. Figs. 459–461. *N. stagninoides*, Mid-Yell, 23 July 1958: 459, marginal cystidia; 460, cap surface from above; 461, a mature basidium. (All × 500.)



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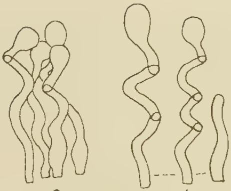

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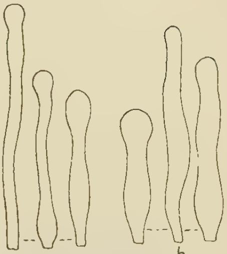

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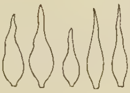

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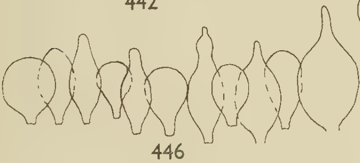

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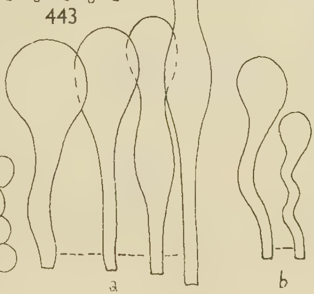

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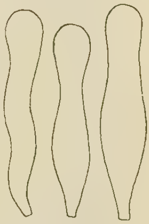

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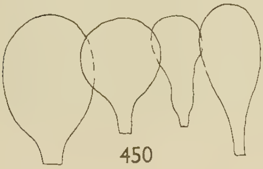

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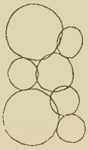

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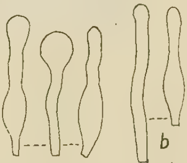

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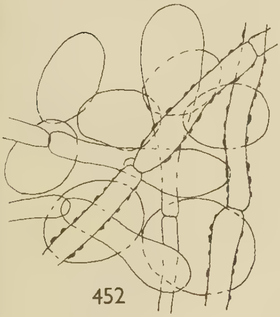

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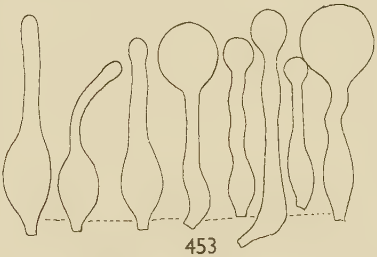

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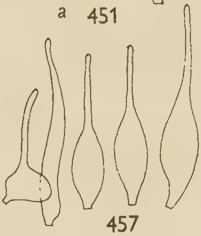

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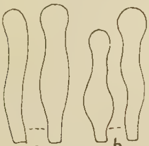

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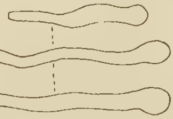

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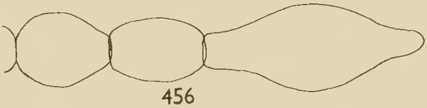

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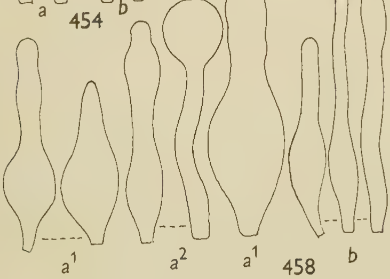

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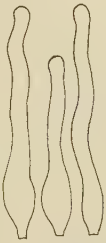

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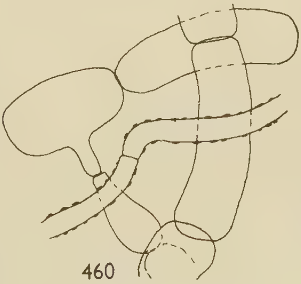

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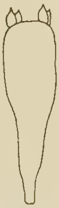

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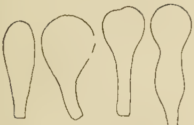
Fig. 462. *Pholiota aromatica*, marginal cystidia, Tomich, 5 Sept. 1957. Fig. 463. *Pleurotellus patelloides*, marginal cystidia, Bindon Landslip, 29 Nov. 1958. Figs. 464, 465. *Pluteus boudieri*, Juniper Hill: 464, cells from cap surface (×250): *a*, 6 Oct.; *b*, 1 Oct. 1955; 465, facial cystidia with pale brownish vacuoles (×500), 1 Oct. 1955. Fig. 466. *P. petasatus*, facial cystidia, Aldbury, Surrey, 9 Oct. 1955. Fig. 467. *P. salicinus*, facial cystidia, Wheatfen Carr, Surlingham, Norfolk, 10 Oct. 1957. Fig. 468. *P. galeroides*, facial cystidia, Mountain Wood: *a*, 11 Oct. 1953; *b*, 8 Oct. 1954. Figs. 469, 470. *P. godeyi*, Polesden Lacey, 5 Oct. 1955: 469, facial cystidia; 470, cells in vertical section of cap surface (×250). Fig. 471. *P. lutescens*, facial cystidia (×500): *a*, Surlingham Wood, Norfolk, 20 July 1956; *b*, Leigh Woods, Bristol, 14 Sept. 1955; *c*, Mountain Wood, East Horsley, Surrey, 8 Oct. 1954. Fig. 472. *P. griseopus*, facial cystidia: *a*, Stinchcombe, 13 Sept. 1955; *b*, Hodgson's Wood, 25 Oct. 1955. Fig. 473. *P. pallescens*, facial cystidia, Wheatfen Carr, 7 July 1958. Fig. 474. *P. xanthophaeus*, facial cystidia: *a*, Bindon Landslip, 29 Nov. 1958; *b*, Allerford Wood, 7 Nov. 1959. Fig. 475. *P. nanus*, facial cystidia: *a*, Bindon Landslip, Rousdon, Devon, 2 Dec. 1958; *b*, Thetford Heath Breck, Norfolk, 2 Oct. 1958. Fig. 476. *P. phlebophorus*, facial cystidia: *a*, Gomshall, Surrey, 8 Aug. 1958; *b*, Polesden Lacey, Surrey, 3 Oct. 1954; *c*, Surlingham Wood, 18 Oct. 1957. (All ×500 except Figs. 464 and 470.)



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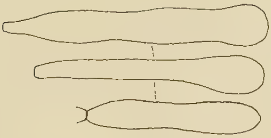

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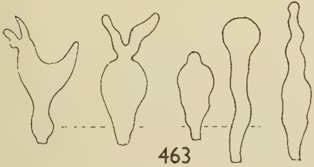

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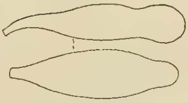

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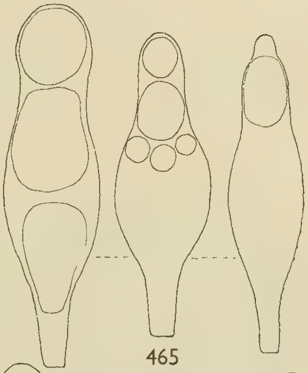

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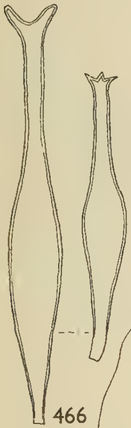

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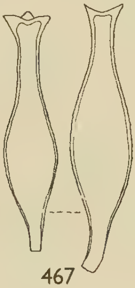

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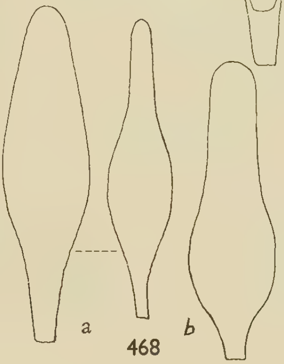

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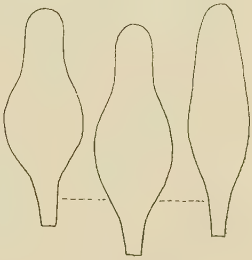

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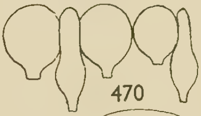

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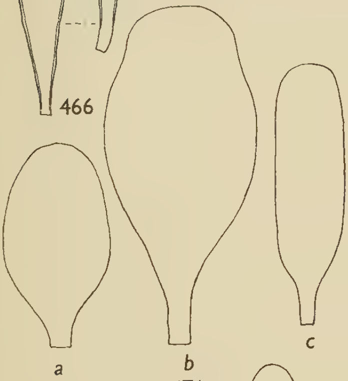

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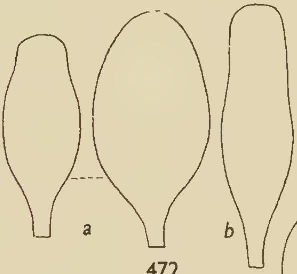

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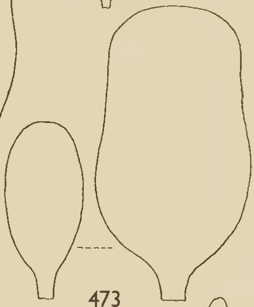

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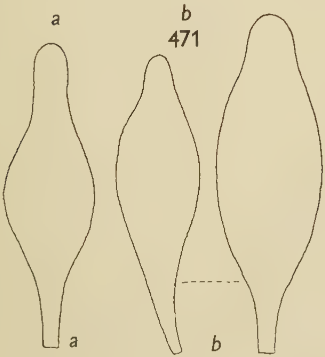

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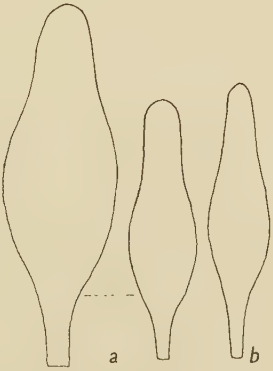

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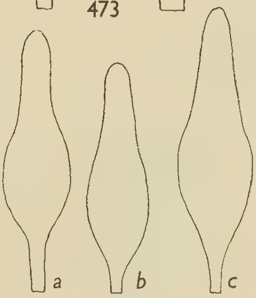

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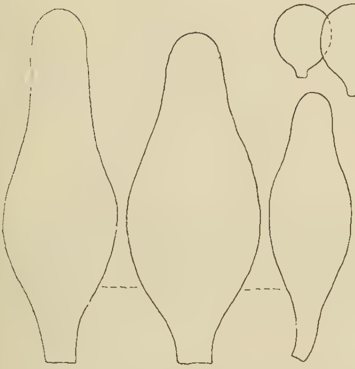
Figs. 477, 478. *Pluteus olivaceus*, Allerford Wood, 7 Nov. 1959: 477, facial cystidia; 478, cells of cap surface (× 250): *a*, in vertical section; *b*, from above. Figs. 479–481. *P. podospileus*: 479, cells of cap surface (× 250), Wheatfen Carr, 23 Oct. 1956; *a*, in vertical section (one with dark pigment mass at apex); *b*, from above; 480, elongate and penultimate cells from cap surface, some with black-brown pigment masses in addition to pale brown vacuolar pigment (not shown), × 500, Surlingham Wood, 9 July 1958; 481, facial cystidia: *a*, Surlingham Wood, 9 July 1958; *b*, Wheatfen Carr, 23 Oct. 1956. Figs. 482, 483. *P. punctipes*: 482, cells from cap surface with pale brownish vacuoles, from above (× 250): *a*, Leigh Woods, 14 Sept. 1955; *b*, Norbury Park, 26 Sept. 1952; 483, facial cystidia with pale brownish vacuole (× 500): *a*, Leigh Woods, 14 Sept. 1955; *b*, Juniper Hill, 1 Oct. 1955. Figs. 484–491. Cystidia: 484, *Psathyrella badiovestita*, facial; *a*, Bear Wood, 11 Oct. 1955; *b*, Lucton, 27 Oct. 1959; 485, *P. cortinarioides*, facial: *a*, Surlingham Wood, 18 Oct. 1957; *b*, Allerford Wood, 8 Oct. 1959; 486, *Pluteus thomsonii*, marginal: *a*, Juniper Hill. 14 Nov, 1954; *b*, Middle Marsh, Surlingham, 18 July, 1956; 487, 488, *Psathyrella flexispora*, Studland: 487, marginal (del. T. J. Wallace), 29 Oct. 1952; 488, facial, 17 Nov. 1958; 489, *P. microlepidota*, marginal: *a*, Thack Marsh, 24 July 1957; *b*, Parish Marsh, 8 July 1958; 490, *P. leucotephra*, marginal, Gomshall, 23 Aug. 1958; 491, *P. gordonii*, marginal, Burnham Beeches, Bucks, 23 Oct. 1955. Figs. 492, 493. *Stropharia aurantiaca*, Bossington: 492, marginal, *a*, 30 Oct. 1957; *b*, 7 Nov. 1959; 493, facial: *a*, 30 Oct. 1957; *b*, 7 Nov. 1959, showing in black refringent body which colours yellow with ammonia. (All × 500 except Figs. 478, 479 and 482.)



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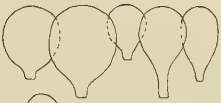

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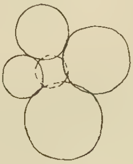

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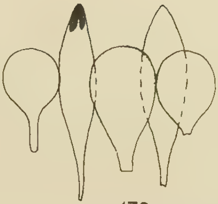

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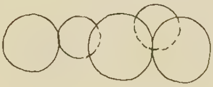

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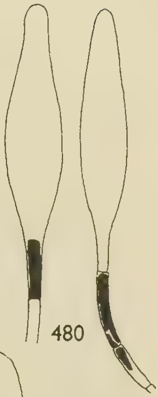

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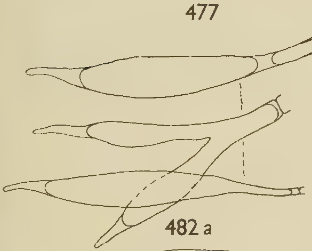

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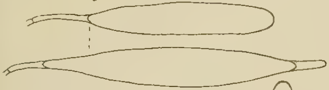

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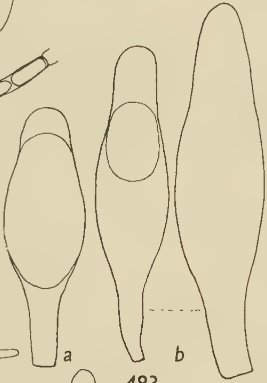

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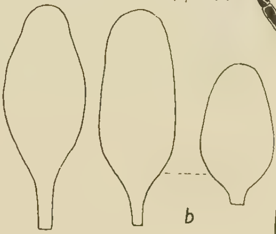

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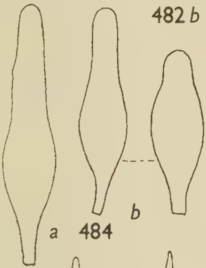

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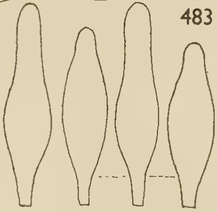

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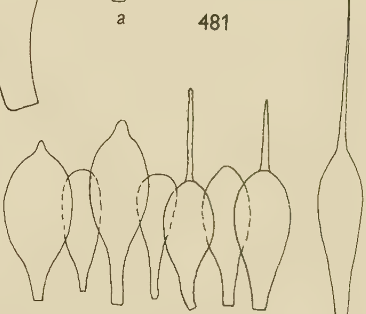

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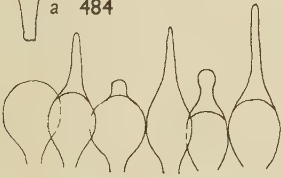

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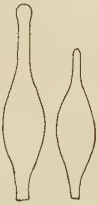

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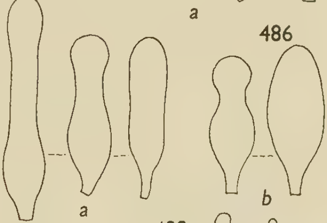

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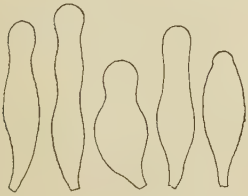

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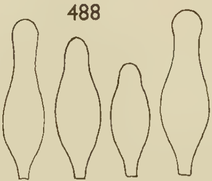

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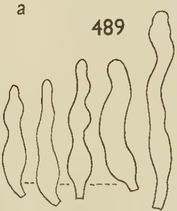

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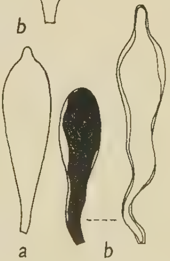

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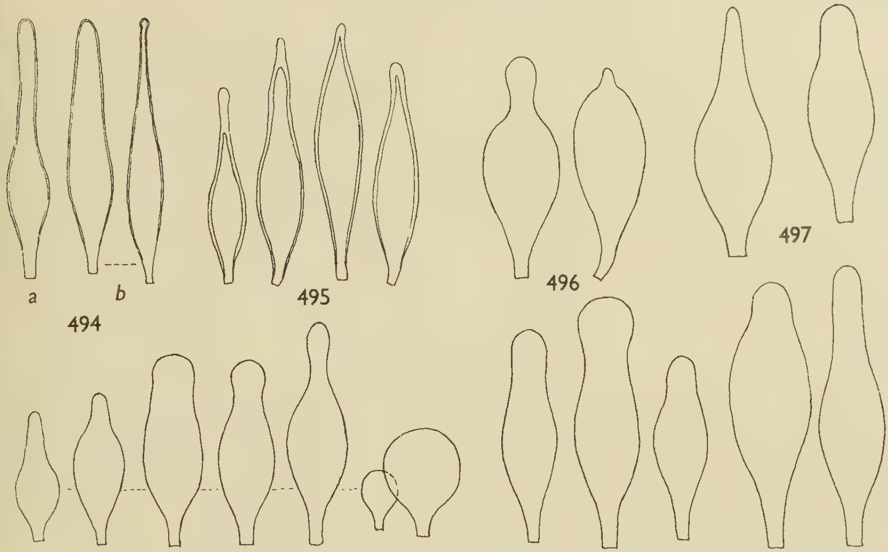
Fig. 494. *Psathyrella spintrigeroides*, facial cystidia, Mountain Wood: *a*, 12 Oct. 1953; *b*, 5 Nov. 1955. Fig. 495. *P. xanthocystis*, facial cystidia showing thick walls, which turn yellowish in ammonia, Badger Falls, 6 Sept. 1957. Figs. 496, 497. *Volvariella pubescentipes*, Norbury Park, 13 Oct. 1956: 496, marginal cystidia; 497, facial cystidia. Figs. 498, 499. *P. vinosofulva*, Dowlands Landslip, 29 Nov. 1958: 498, marginal cystidia; 499, facial cystidia. Fig. 500. *Pluteus luteovirens*, facial cystidia, Kenley Bottom, 13 Aug. 1958. (All × 500.)

Figs. 501–505. *Laccaria striatula*: 501, 502, Glenesk, 3 Sept. 1955; 503–505, Shobdon, 31 Oct. 1959. Figs. 506, 507. *Hygrophorus* (Camarophyllus) *subviolaceus*, Membury, 2 Nov. 1957. Figs. 508–511. *H.* (Hygrocybe) *schulzeri*, Membury; 508, 29 Oct. 1957; 509, 510, 2 Nov. 1957; 511, 3 Nov. 1957. Figs. 512, 513. *Eccilia paludicola*, Amberley, 25 May 1959. Fig. 514. *Dermoloma josserandii*, Hawkridge, 15 Sept. 1958 (del. R. W. G. Dennis). (All × 1.)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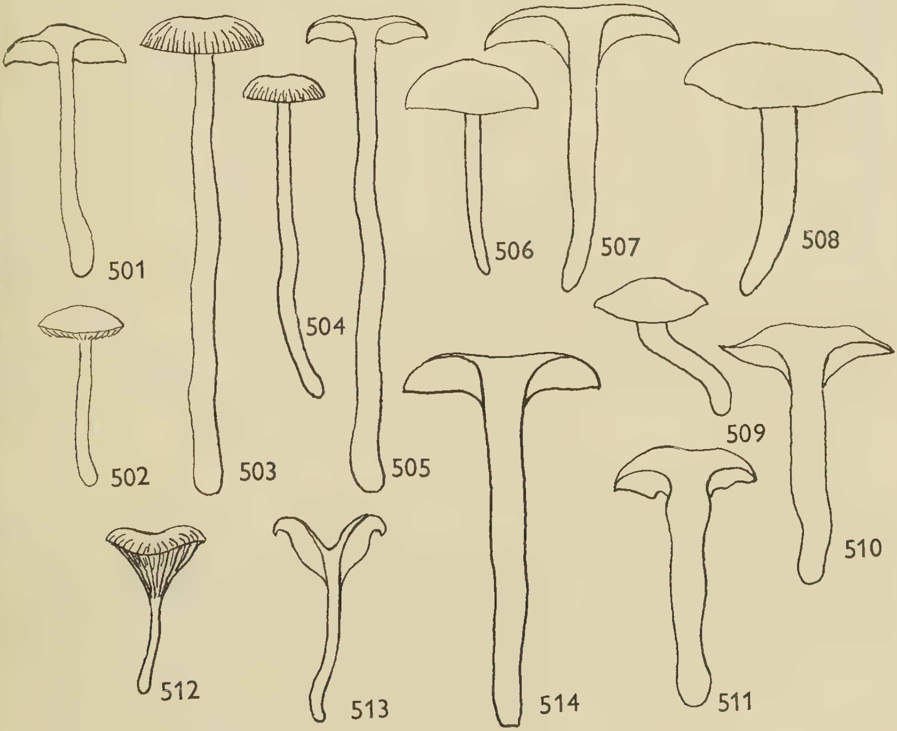
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Trans. Brit. mycol. Soc. **43** (2), 440–459 (1960).

NEW CHECK LIST OF BRITISH AGARICS AND BOLETI

PART IV. VALIDATIONS, NEW SPECIES AND CRITICAL NOTES

By F. B. HORA

Department of Botany, University of Reading

(With 7 Text-figures)

Most of this Part consists in the validation of names already published, but which were illegitimate in terms of the International Code of Botanical Nomenclature. However much one may be irritated or exasperated by the present Rules, it is obvious that if the very desirable aim of uniformity of nomenclature is to be achieved, then one must attempt to apply the Rules to the best of one's ability. For various reasons the results may not always be final and mistakes may creep in, but unless the Rules are accepted by one and all—and in their entirety—and a conscientious effort is made to apply them, no progress can be made towards standardizing the nomenclature.

In addition to the validations, a few new species are described and some notes given on selected species.

The arrangement is in alphabetical order of genera. The descriptions follow conventional lines. I have, however, consistently made use of one descriptive word which I hope will come to be generally accepted. This is the word *dextrinoid*, to describe those white-spored species whose spores take on a deep red-brown colour when mounted in Melzer's iodine solution. The spores of the majority of *Lepiota* species are of this kind. I know that Singer coined the word *pseudo-amyloid* for precisely this reaction, but I have always thought the choice most unfortunate. The word *amyloid* itself carries with it the meaning of 'not really starch', and to precede this with the prefix *pseudo-* seems to me quite illogical. Furthermore, we tend to use the prefix *pseudo-* far too much in agaricology. Dextrins give a red-brown colour with solutions of iodine, so that *dextrinoid* is the natural word to contrast with *amyloid.*

I also feel strongly that the word *amyloid* itself should refer only to the *blue-black* colour given when the spores of certain white-spored agarics or other fungus spores and structures are mounted in Melzer's iodine and that its use should not be extended to cover the *wine-red* or *purplish red* colour given when the context of some fungi, for example, certain species of *Mycena,* is mounted in this iodine solution.

CLITOCYBE

Clitocybe langei sp.nov. (Fig. 1 B)

Pileo carnosulo, 20–50 mm. lato, e plano infundibuliformi, glabro, fortiter hygrophano (udo), dilute brunneolo margine mox patente pellucido-striato, (sicco) albido vel dilute griseo et margine non striato; lamellis primitus adnatis, dein longe decurrentibus, vix confertis, dilute fuscidulo-griseo; stipite cum pileo concolori primito nebula arachnosa conspersa dein glabro, ad basim semper albo strigoso-tomentoso; carne udo griseo-brunneo, sicco plus minus griseo-alutaceo; odore et sapore dilute rancido-farinaceo; sporis in cumulo albis, levibus, lacrimo-formibus, 5–6·5 × 2·7–3·2 μ, non amyloideis. In pinetis. Typus: College Wood, Mortimer, Berks, 22 Oct. 1955, in Herb. Hora.

Cap 20–50 mm. wide, at first plano-convex, then infundibuliform, not particularly fleshy, very hygrophanous, *when wet a pale brownish beige* with the *margin plainly pellucid-striate*, when dry more or less tinged pale alutaceous and the margin opaque; *gills* not very crowded, pale greyish brown, at first adnate, finally deeply decurrent; *stipe* 20–35 × 4–5 mm., more or less, equal, concolorous with cap, at first rather felty with whitish filaments, the base always cottony-tomentose; *flesh* when wet pale brownish, drying out whitish alutaceous; taste and smell rancid-mealy; *spores* in mass white, 5–6 × 2·7–3·2 μ, smooth, *tear-drop shaped*, non-amyloid. In pine woods. Type: College Wood, Mortimer, Berks, 22 October 1955, in Herb. Hora.

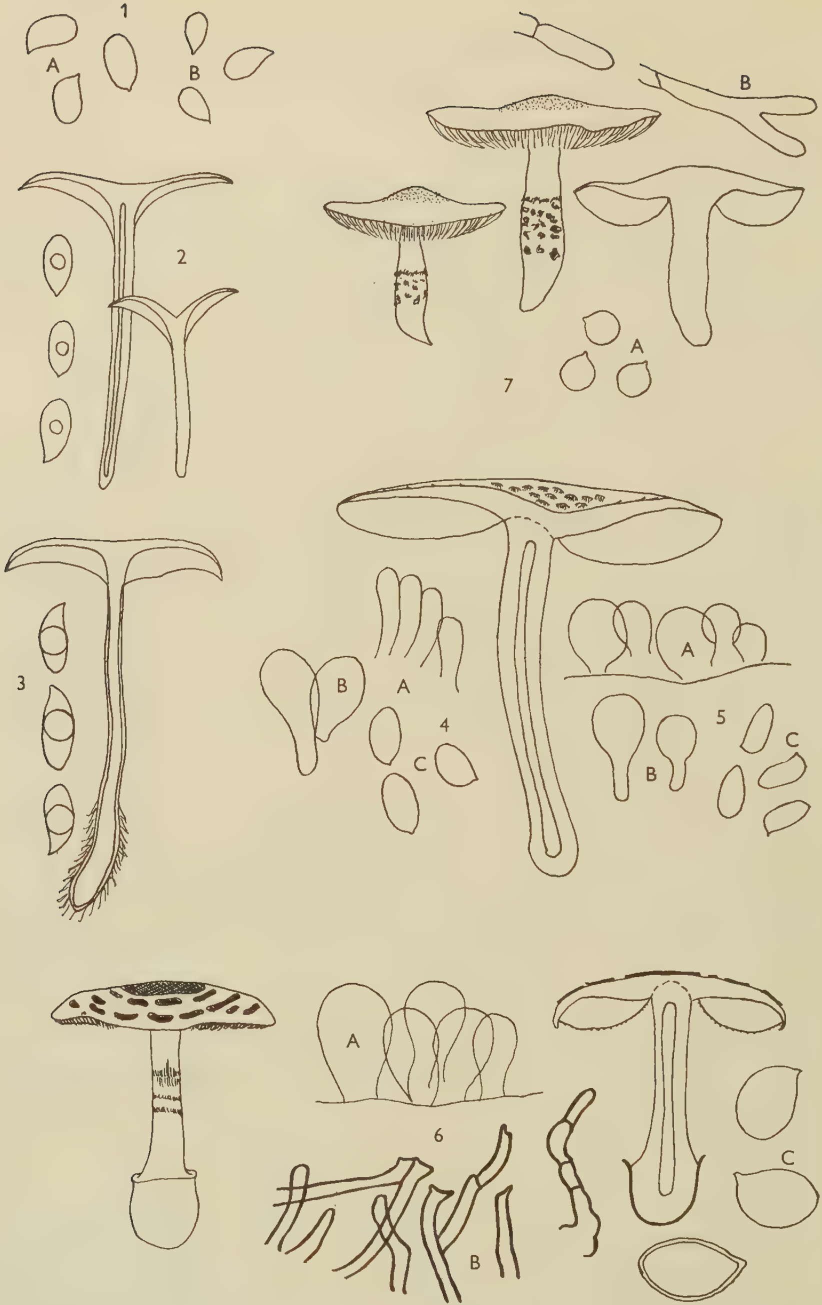
Observations. C. vibecina has been differently interpreted by agaricologists. Lange's interpretation (*Flora Agaricina Danica*, 1 (1935), p. 84 and t. 37A) was given the new name *C. langei* Singer in *Ann. Mycol.* **41** (1943), 44, without a Latin diagnosis.

True *C. vibecina* is now taken in the sense of Favre in *Materiaux pour la Flore Cryptogamique Suisse*, **10** (3) (1948), 63, where an excellent description and figures of both species can be found. *C. langei* differs from *C. vibecina* in the water-soaked cap being more brownish and less grey, although this difference is liable to be obscured by frost. The best differential character is in the spores. In *C. langei* they are less than 3·5 μ wide and are tear-drop shaped, that is, blunt at one end; in *C. vibecina* they are 3·4–4 μ wide and ellipsoid-cylindric, that is, more or less equally blunt at both ends and, for at least part of the length, with parallel walls.

In my experience, *C. langei* is a common species in this country, more so, in fact, than *C. vibecina*, from which British agaricologists have only recently begun to distinguish it.

Clitocybe quercina Pearson sp.nov. (Fig. 2)

Pileo 20–60 mm. lato, ± carnoso, hygrophano, rigido-elastico tenaci, e convexo plano-umbilicato vel infundibuliforme, colore udo primitus aquose brunneolo-incarnato in olivaceum transiente demum dilute griseo in centro obscuriore, sicco plus minus sordide albido levi, margine initio incurvo-striato, regulo vel undulato-lobato; lamellis confertis 2–6 mm. latis, inaequalis, decurrentibus saepe arcuatis, interdum venoso-connexis; stipite 50–60 × 4–5 mm. elastico-rigido-tenaci, sub-fibrilloso-striato, aequali vel deorsum attenuate, ad apicem albido, ad basim griseo-brunneo; carne pallida; odore et sapore farinaceo obsoleto, vix rancido, interdum sub-amaro; sporis in cumulo albis, levibus, ellipsoidalibus vel sub-cylindraceis 6½–8 × 3½–4¼ μ, non amyloideis; hyphis cuticularibus jacentibus instructis 3–4 μ latis; trama regulari; cystidiis nullis; basidiis 4-sporis. Inter folia praecipue Quercus, interdum inter acus coniferorum. Typus: ad Courtaulds prope Maidenhead, Berks, 7 Nov. 1957, in Herb. Hora.



(Fruit bodies all × ½; spores × 1000; all other microscope drawings × 500.)

Fig. 1. A, spores of *Clitocybe vibecina*; B, spores of *C. langei*.
Fig. 2. *Clitocybe quercina*. Fruit bodies and spores.
Fig. 3. *Collybia* (Tephrophana) *fusispora*. Fruit body and spores.
Fig. 4. *Lepiota cookei*. Fruit body and: A, marginal cystidia; B, vertical section at cap disk showing hymeniform cuticular cells; C, spores.
Fig. 5. *Lepiota friesii*. A, B, marginal cystidia; C, spores.
Fig. 6. *Lepiota emplastrum*. Fruit bodies and: A, marginal cystidia; B, vertical section at cap disk showing thick-walled erect hyphae of cuticle; C, spores.
Fig. 7. *Limacella roseofloccosa*. Fruit bodies (after a painting by P. D. Orton); A, spores; B, hyphae from cap cuticle

Cap 20–60 mm. across, fleshy, hygrophanous, *rigid-elastic*, at first convex then flat and umbilicate or infundibuliform, pale watery olive-brown with *pinkish tinge when wet* and becoming greyish with darker disk, drying out dingy white, margin striate and involute, regular wavy or lobed; *gills* crowded, narrow, linear or arcuate, 2–6 mm. wide, unequal, decurrent, sometimes with connecting veins; *stipe* 50–60 × 4–5 mm., rigid, equal or attenuated downwards, white above, greyish brown below, fibrillosely striate; *flesh* greyish white; *smell and taste* somewhat mealy, hardly rancid but at times bitterish; *spores* in mass white, cylindric-ellipsoid, 6½–8 × 3½–4¼ μ, non-amyloid; cuticle filamentous, hyphae 3–4 μ wide, trama regular; cystidia absent; *basidia* 4-spored. Mainly in oak leaves but also amongst conifer needles. Type: Courtaulds near Maidenhead, 7 Nov. 1957, in Herb. Hora.

Observations. I had no hesitation in referring my original gatherings of this fungus to *C. fritilliformis* sensu Ricken (*Die Blätterpilze* (1915), p. 378 and t. 104, 2). The outstanding characteristic, also emphasized by Ricken, is the remarkable elastic-rigidity of the whole toadstool. In general appearance, more especially in the stem which is whitish above and much darker below, it recalls *C. dicolor*; but this is much less rigid and, moreover, has a faint but distinct mealy taste and smell. I am indebted to P. D. Orton for drawing my attention to an unpublished painting and description by the late A. A. Pearson of a toadstool to which he gave the provisional name *C. quercina*. Pearson's gatherings were made at Hindhead, Surrey, also late in the season, namely, 25 Nov. 1950. Here again, I have no doubt that Pearson's specimens collected from amongst oak leaves are identical with mine taken from amongst conifer needles—both being *C. fritilliformis* sensu Ricken, who also noted the different habitats '. . . amongst leaves and needles in wooded places.' Ricken, too, said that the time of occurrence is Oct. or Nov.

C. fuligineipes Métrod nom.nud. (*Bull. Soc. mycol. Fr.* **55** (1939), 108) is certainly very close and was considered later by Métrod (*Rev. Mycol.* **14** (1949), Suppl., p. 35) to be identical with *C. fritilliformis* sensu Ricken. Métrod's species, however, is predominantly brownish with acrid taste and musty smell. Moreover, he considered it to be identical with *C. brumalis* sensu Konrad & Maublanc (*Icones Selectae* **3** (7) (1932), t. 298). Bearing these things in mind, I am convinced that Kühner & Romagnesi (*Flore Analytique*, 1953, p. 141, note 7) are right in their view that *C. fuligineipes* cannot be the same as *C. fritilliformis* sensu Ricken.

COLLYBIA

Collybia (Teph.) **fusispora** sp.nov. (Fig. 3)

Pileo carnosulo ad 50 mm. lato, hygrophano, udo avellaneo vel olivaceo-brunneo, sicco sordide albido, convexo-plano; lamellis cinerello-albidis, adnexis vel adnatis, ± leviter arcuatis, moderate confertis; stipite ad 90 × 4 mm., sordide pallido, sub-compresso, ad apicem filamentoso-tomentoso, ad basim strigoso; carne firma; odore et sapore farinaceo-rancido; sporis in cumulo albidis, fusiformibus 9½–11 × 3½–4 μ, non amyloideis; basidiis 4-sporis, cum carminophilis granulis; hyphis cuticularibus jacentibus instructis; cystidiis nullis. Inter folia praecipue in silvis Fagetis. Typus: Gomshall (Surrey), 3 Nov. 1953, in Herb. Hora.

Cap to 50 mm. across, fleshy-membranous, hygrophanous, brown to olive-brown when moist, drying out to dirty whitish, plano-convex; *stipe* to 90 × 4 mm., dirty whitish, somewhat compressed, tough, cottony-fibrillose above, strigose at the slightly swollen base, stuffed; *gills* adnexed to adnate, more or less horizontal and arcuate, rather crowded; flesh whitish (dry); *taste and smell* mealy-rancid; *spores* in mass white, *fusiform*, 9½–11 × 3½–4 μ, non-amyloid; *basidia* 4-spored with carminophil granules; *cuticular hyphae* filamentous; *cystidia* absent. Amongst leaves in woods especially beech. Type: Gomshall, 3 Nov. 1953, in Herb. Hora.

Observations. This species is distinct among the TEPHROPHANAE by its large fusiform spores each with a big central gutta. It is probably the species Rea had in mind when he described *Tricholoma putidum* (*British Basidiomycetae* (1922), p. 243), although he says the habitat is 'fir woods and amongst pine needles'. *T. putidum* proper is here taken in the sense of Lange (*Flora Agaricina Danica*, I (1935), 64 and t. 30 B, B′). The length of its ellipsoid oval spores is about half that of *C. fusispora*.

LACTARIUS

In this genus, as in *Russula*, spores have been examined in Melzer's iodine solution: measurements were made from optical sections of the spore walls and exclude the ornamentation.

Lactarius lacunarum sp.nov.

Pileo 20–50 mm. lato, carnosulo, sicco, e convexo plano-depresso, vix papillato, ruguloso, rufo-aurantiacis vel fulvo, pallescente, margine non striato; lamellis pallidibus; stipite 20–45 × 3–8 mm., aequali, primitus pallido, mox pileo concolori vel deorsum obscuriore; lacte ex albo lutescente, primitus miti, tarde sub-acri vel amaro; odore sub-nullo; sporis in cumulo flavidis ('C–D Crawshay'), 7–9 × 5½–6½ μ, verrucosis et reticulosis vel sub-reticulosis lineis anastamosantibus; cystidiis fusiformibus 6–7 μ latis; hyphis cuticularibus filamentosis 2–4 μ latis. In locis paludibus sub alnis, betulis, salicis, etiam pinis. Typus: Mortimer, Berks, 9 Sept. 1951, in Herb. Hora.

Cap 20–50 mm. wide, somewhat fleshy, dry, at first convex then plano-depressed, indistinctly papillate and rugulose, fulvous or rufous-orange, expallent, margin not striate; *gills* pallid; *stipe* 20–45 × 3–8 mm., equal, at first pallid, soon concolorous with cap or darker towards base; milk at first white, *tardily yellow* (best seen when drop is placed on handkerchief), *mild but soon distinctly bitterish to subacrid*; smell faint; *spores* in mass *creamy yellow* (C–D of Crawshay), 7–9 × 5½–6½ μ, with coarse warts made reticulate or sub-reticulate by crests or fine lines; *cystidia* fusiform 6–7 μ wide; *cuticular hyphae* filamentous 2–4 μ wide. *In wet places*, commonly under alder, birch, willow, even pine. Type: Mortimer, 9 Sept. 1951, in Herb. Hora.

Observations. This fungus was first described by Romagnesi (*Bull. Soc. mycol. Fr.* **54** (1938), 223) as *L. decipiens* var. *lacunarum*. He gave a good plate in the same journal (**54** (1939), Atlas, t. 82). No Latin description was provided. J. Lange raised it to specific rank (*Flora Agaricina Danica*, V (1940), 46), but without a Latin description.

Lactarius subsericeus sp.nov.

Pileo carnoso 20–90 mm. lato, e plano-convexo depresso, sicco, sub-sericato, rufo-aurantiaco disco badio-rufo, expallente, margine longe involuta: lamellis in adultis decurrentibus, sub-confertis, saepe postice sub-ramosis, ochraceis rufescentibusque; lacte primitus miti, mox in faucibus plus minus acri, primitus albo, tarde subsulphureo; stipite 20–60 × 7–15 mm., solido, saepe deorsum attenuato et excentrico, in basi purpureo-badio, apice pallidiore et sub lamellis sulcato; sporis in cumulo ochraceis ('C–D, D, Crawshay'), 7–9 × 6½–7½ μ, sub-globosis, ornamentis variis; carne firmo, subrufescente; odore debile, grato, Lactarium quietum revocante; cystidiis fusiformibus, acutis; epicute filamentosa, hyphis intermixtis; cute pseudo-parenchymata. In pinetis et silvis frondosis, solo calcareo, raro. Typus: Dysonswood, Tokers Green, Reading, Berks, 25 Aug. 1954 in Herb. Hora.

Cap fleshy 20–90 mm. across, at first plano-convex then depressed, dry and with a somewhat silky appearance, orange-reddish with the disk darker and more brownish red, drying out paler, margin for a long time involute; *gills* when mature decurrent, rather crowded, often branched behind, ochraceous rufescent; *milk* at first mild but soon more or less acrid to the throat, white then slowly yellowing; *stipe* 20–60 × 7–15 mm., solid, often attenuated below and excentric, the base purplish brown, apex paler and sulcate below the gills; *spores* in the mass yellowish ochre (C–D, D, Crawshay), 7–9 × 6½–7½ μ, subglobose, ornamentation various; flesh firm, somewhat rufescent; smell faint, pleasant, like *Lactarius quietus*; *cystidia* fusiform, acute; *epicutis* filamentous, the hyphae interwoven; *cutis* pseudo-parenchymatous. In pine woods and deciduous woods on calcareous soil, rare. Type: Dysonswood, Tokers Green, Reading, 25 Aug. 1954, in Herb. Hora; also found at Foxhill, Whiteknight's, Reading, 19 Sept. 1956.

Observations. This is *L. ichoratus* sensu Romagnesi who gave a very full description of it (*Rev. Mycol. Paris*, 7 (1), 1943, Suppl., p. 5). In my view, *L. ichoratus* should be treated as a *nomen confusum*; there has not even arisen a tradition about its application and only recently Neuhoff (*Die Milchlinge*, 1956, p. 203) has given yet another interpretation based mainly, I think, on an unpublished picture of Fries's supervision. For me, at least, this evidence loses much of its value because Neuhoff (loc. cit. p. 208) regards *L. ichoratus* sensu Romagnesi as a synonym of *L. rubrocinctus*, the latter not only in terms of the Friesian descriptions but also as interpreted by J. Lange who gave a good coloured plate (*Flora Agaricina Danica*, v (1940), p. 44 and t. 176 D). I have made several gatherings of *L. ichoratus* sensu Romagnesi, and since that author's description was made as long ago as 1943 and is very complete, I think less trouble will arise if this interpretation is maintained. As I have rejected the name *L. ichoratus*—moreover, Romagnesi's interpretation does not accord with Friesian descriptions—a new name becomes necessary. I have, accordingly, taken up a suggestion of Kühner in Kühner & Romagnesi (*Flore Analytique*... (1953), p. 520) in selecting the binomial *L. subsericeus* (he used *subsericatus*). The species is very closely related to *L. fulvissimus* Romagnesi, which I have also gathered in this country and which, incidentally, Neuhoff (*loc. cit.* p. 204) places under *his* interpretation of *L. ichoratus*.

LEPIOTA

Lepiota cookei sp.nov. (Fig. 4 A–C)

Pileo ad 100 mm. lato, denique expanso squamis adpressis secedente, brunneo, centro levi, obscuriore; lamellis ex albo pallide flavescentis, confertis, simplicibus, liberis, ab stipite plus minus remotis; stipite colore ut in lamellis, levi, farcto, clavato, denique ad basim rufo discolorante; annulo haud manifesto; carne albo; odore grato, Inocybum pyriodorum revocante; sporis in cumulo albis, sub-cylindraceo-ellipsoidalibus, levis, 6½–7½ × 4–4½ μ, dextrinoideis; acie lamellarum cystidiis obtusis, cylindraceis vel subclavatis, 5–7 μ latis; cute pilei in centro cellularis hymeniformibus composita; trama lamellarum regulari. Inter folia coniferae, raro. Typus: ad Courtaulds prope Maidenhead, Berks, 31 Oct. 1958, in Herb. Hora.

Cap to 100 mm. across, finally more or less expanded and broken up into *adpressed squamules*, pale brown, darker at the smooth disk; *gills* white at first then pale yellowish, crowded, *unbranched*, free and more or less remote from the stipe; *stipe* concolorous with gills, somewhat clavate, finally reddish brown at the base, smooth, stuffed; *ring* small, fugacious; *flesh* white; *smell* faint, *like Inocybe pyriodora*; *spores* white in mass, subcylindrico-ellipsoid, smooth, 6½–7½ × 4–4½ μ, dextrinoid; *marginal cystidia* obtuse, hair-like or slightly swollen above, 5–7 μ wide; *cap* cuticle at disk made up of compact hymeniform cells; *gill trama* regular. In coniferous litter, rare. Type: grounds of Courtaulds near Maidenhead, 31 Oct. 1958, in Herb. Hora.

Observations. This species comes close to *L. acutesquamosa* as described by Kühner in *Bull. Soc. mycol. Fr.* **52** (1936), 207, and in Kühner & Romagnesi, *Flore Analytique*... (1953), p. 397. *L. cookei* differs, however, in having uniformly adpressed squamules (the outer edges of which have a slight tendency to turn up), the absence of anything like conical warts, in the much wider spores and the faint but distinct smell of ripe pears, which is particularly evident two days after the toadstool has been gathered. I believe Cooke's *Illustration*, 1105(941), is a good representation of this toadstool and not of *Agaricus* (Lepiota) *friesii* Lasch which is the name Cooke applied to this particular illustration, and to a consideration of which I now turn.

There seems to me little doubt that the toadstool which British and many continental agaricologists call and have called *Lepiota acutesquamosa* should be referred to *Agaricus friesii* Lasch. Where the mistake has been made, it is, I think, due to the determinations of workers being based on, or derived from, the descriptions given by Fries rather than the original description of Lasch. Thus, Fries in *Hymen. Europae* (1874), p. 31, under *A. friesii*, emphasizes that the cap has *adpressed squamae*, but makes no mention of anything like erect, conical warts or papillae; he does, however, emphasize *erect*, *acute*, *squarrose*, *thorny squamae* for *A. acutesquamosa* which he places at an infra-specific level under his *A. friesii*. From this it is easy to see how, under the authority of a statement by Fries, a tradition could have arisen that *A. friesii* Lasch has a more or less smooth cap devoid of conical warts, these latter being present in *A. acutesquamosa*. In *Flora Agaricina Danica*, 1 (1935), 26, J. Lange adds a note to what he also calls *L. acutesquamosa* which reads: 'Large specimens of this species are sometimes mis-named *L. friesii*. But the true *L. friesii* (Lasch) Fr. should have large, adpressed, brown scales only, no pyramidal ones.' Reference to *Linnaea*, **3** (1828), 155, shows that Lasch in describing *A. friesii* clearly stated: 'Pileus ex ovato plano-convexus, leviter umbonatus, versus medium papillis conicis et squamis squarrosis, ad margin magis villosi, fusco-cinnamomeis, densissime vestitus, 4–5 unc. latus.'

The situation was also rather complicated by Ricken. In his *Die Blätterpilze* (1915), pp. 321, 322, he described *L. hispida* and *L. friesii*, saying under the latter that *L. acutesquamosa* was identical. He also gave two coloured plates (Taf. 86, 1 and 2). Before being aware of Lasch's original description of *L. friesii*, it was evident to me that toadstools which, following the prevalent tradition, I had named *L. acutesquamosa*, were identical with *L. hispida* sensu Ricken. With Lasch's original description to hand, it was equally evident that Ricken's *hispida* was Lasch's *friesii*! In his later *Vademecum für Pilzefreunde* (1920), p. 11, Ricken corrected his error and under *L. friesii* cited both the description and plate of *L. hispida* from his *Die Blätterpilze*. He also described *L. acutesquamosa* as a distinct species and gave a fresh description of *L. hispida*.

In the latest treatment of these species, Kühner & Romagnesi (*Flore Analytique*...(1953), p. 397) for the most part followed the earlier treatment by Kühner (*loc. cit.*). True *L. friesii* is called *L. acutesquamosa* var. *furcata* Kühner and *L. acutesquamosa* type is given a careful description which makes it plainly distinct from the variety.

The present situation in this country is as follows. We have *L. friesii* (Lasch) Quél., which, following the British tradition, we have called *L. acutesquamosa* and which is also known as *L. acutesquamosa* var. *furcata* Kühner; we also have *L. cookei*. There is no authentic record of *L. hispida* (Lasch) Gillet, Cooke's *Illustration*, 28(27), being *L. hystrix* Møller & Lange and this has probably become the British tradition. In any case, no unequivocal interpretation of *L. hispida* has yet emerged. *L. acutesquamosa* is best interpreted in the sense of Kühner, as he gives a clear description of it. As such, I have not seen any British specimens, but it most probably occurs.

Lepiota emplastrum Cooke & Massee (Fig. 6)

The description of this species and Cooke's *Illustration*, 1106(1164), have generally been held to refer to *L. rhacodes*. Admittedly, the spores figured are given the measurements 20 × 10–12 μ (typical *L. rhacodes* has spores just about half this size), but since they are shown as more or less wavy nodulose, it seems evident that they do not belong to any species of *Lepiota* at all, but are a contaminant from some species of the Rhodophyllaceae. I have myself, therefore, always felt *L. rhacodes* to be a quite reasonable detemination. This was also the considered view of Maire and also of Rea (these *Trans.* **20** (1935), 86) in their annotations of Cooke's *Illustrations*; on the same page Quélet also suggested *L. rhacodes* as a possibility. However, a specimen turned up in grass in the grounds of Reading University (*L. emplastrum* was found 'amongst grass') which had such a striking resemblance to Cooke 1106(1164) that I am convinced it is Cooke

& Massee's species. There is the same colouring, the same remarkable cuticle and the same pinking of the cut flesh. The one discrepancy is that my specimen had distinct evidence of a volva. This is not shown in the illustration (which, incidentally, was executed by Massee). It does, however, show a distinct membranous ring with *brown markings on the underside*, which, at least in the two pictures of whole fruit-bodies, looks as if it is a sheathing ring from the base upwards. I think it quite possible that Massee mistook the circumscissile volva as a dropped movable ring and 'lifted it' in his painting. In this connexion, the brown markings are relevant, because the volva in my specimen, as might be expected, is made up of the same thick-walled brown hyphae as is the cap cuticle and is concolorous with the cuticle. Both are derived from the universal veil. I feel sure Massee saw the brown outer side of the free part of the volva and represented it on the under side of the 'lifted ring'.

The following additional notes may be added. The subcuticular layer at the extreme edge overlapped the gills by 2–3 mm., and the gills themselves had a beaded brownish edge and gave no reaction with strong ammonia. The ring was fugacious, leaving only vague remains; the stipe was easily separable from the cap and had a sub-bulbous base.

The gill trama was lax and interwoven, but less so than in *L. procera*. Only marginal cystidia were present (Fig. 6A) and these were more or less obpyriform. The cuticle was tough and made up of thick-walled hyphae which projected in a vertical direction, the walls and vacuolar sap being brownish. The volva was made up of similar hyphae. The thickness of the cuticular layer was about 300 μ, and beneath it were closely packed thin-walled hyphae running more or less parallel with the surface of the cap. The spores were strongly dextrinoid and plainly metachromatic, measuring 10–12 × 7–8 μ, each with 1–2 guttulae. I could see no germ pore. This absence of a germ pore recalls a matter that has been puzzling me for some time. The large species of *Lepiota* such as *L. procera*, *L. rhacodes*, etc., are grouped together in the section Procerae. One of the characteristics of this section is the presence of a particularly evident germ pore. I have seen and figured the germ pore in *L. procera*, but have not been able to find it in every gathering of this species. I have not found it in *L. rhacodes*. In the latter case, I had electron microscope pictures made, but even here no clear evidence of a germ pore was seen. A faint truncation at the apex could be imagined, but was hardly convincing. I find it difficult to believe that the same species can have races with and without a germ pore. I shall be interested to know the experience of other agaricologists.

Lepiota kuehneri sp.nov.

Pileo 45–70 mm. lato, plus minus convexo-hemisphaerico dein conico-obtuso, subfusco-incarnato, mox in floccoso-squamulis secedente, centro levi vel (sub lente) paucis papillis obtecto; lamellis confertis, albis, sub-ventricosis, liberis; stipite 30–60 × 4·5–6·5 mm., sub-aequali, interdum sub-clavato, sub-fusco-incarnato, deorsum floccoso-tomentoso, in parte media velo copioso et laxe obtecto, et paucis floccis incarnatis ferente; annulo membrano nullo; sporis in cumulo albis, ellipsoidalibus 5·5–7·0 × 3·2–4·0 μ; basidiis 4-sporis 28–34 × 6·5–7·5 μ; acie lamellarum pilis obtusis ventricoso-fusiformibus 7–8 μ latis; cute pilei ex hyphis aseptis longis erectis ab strato cellularum hymeniformium disjunctarum exortis; hyphis fibuligeris; carne albido; odore et sapore debile, ut in Lepiota cristata, sed dulciore. In pinetis. Typus: Wokefield, Reading, Berks, 20 Oct. 1956, in Herb. Hora.

Cap 45–70 mm. wide, at first more or less campanulate-hemispherical, finally conico-obtuse, *brownish pink*, the *cuticle soon breaking up into numerous tomentose flecks*, the disk remaining entire but seen to be sometimes beset with a few pointed squamules when examined with a lens; *gills* crowded, white, subventricose, free; *stipe* 30–60 × 4·5–6·5 mm., subequal, at times somewhat clavate, brownish pink and floccose-tomentose below, the middle region beset with a copious, loose woolly veil, bearing a few pinkish brown flecks; *membranous ring absent*; *spores* in mass white, ellipsoid or ovoid-ellipsoid 5·5–7·0 × 3·2–4·0 μ; *basidia* 4-spored 28–34 × 6·5–7·5 μ; edge of gills with obtuse, ventricose-fusiform hairs 7–8 μ wide; *cap cuticle* at disk with *long, erect, aseptate hairs, arising above a discontinuous more or less hymeniform layer*; clamps present; *flesh* whitish; *taste* and *smell* weak, a little like *L. cristata* but more pleasant. In pine woods. Type: Wokefield, Reading, 20 Oct. 1956.

Observations. A fungus, evidently this species, was given a careful description by Kühner in *Bull. Soc. mycol. Fr.* **52** (1936), p. 228, but there referred by him to *L. clypeolarioiodes* Rea, though with considerable hesitation. A full description of this from Dutch material, which is much more in accordance with Rea's description and with Cooke's *Illustration*, 29(38), referred to by Rea, and which is plainly distinct from Kühner's conception, was given by Huijsman (*Meded. Ned. Mycol. Vereeniging*, **28** (1943), p. 25). *L. clypeolarioides* s. Kühner therefore required a new name; Huisjman (p. 27) proposed *L. kühneri*, but without the necessary Latin description.

Lepiota pseudohelveola sp.nov.

Pileo 18–50 mm. lato, plus minus convexo, interdum plano, sordide fuscidulo-griseo, saepe incarnato, levi, in centro hispido, ad marginem in fundo albido squamulis tenuibus secedente; lamellis albis, haud confertis, liberis, plus minus ab stipite remotis; stipite 30–60 × 2–5 mm., sub-aequali sursum attenuato, plus minus incarnato-fuscidulo, sub-sericeo interdum sub-squamulos vel deorsum sub-floccoso; annulo membrano manifesto, plus minus floccoso-tomentos, dilute incarnato-fuscidulo; sporis in cumulo albis, ellipsoidalibus 7–10(11·5) × 4·0–4·7(6·5)μ; basidiis 4-sporis 21–29 × 7·5–8·5μ; acie lamellarum pilis ventricoso-fusiformibus 4–8 μ latis; trama lamellarum ex hyphis plus minus intermixtis, cylindraceis 4–8 μ latis composita; cute pilei in disco ex hyphis aseptis longis erectis 10–12 μ latis, ab strato cellularum plus minus hymeni formium disjunctarum exortis; hyphis fibuligeris; carne albo vel pallido; odore nullo veldebile et grato. In solo nudo. Typus: Windsor Great Park, Berks, 18 Oct. 1957, in Herb. Hora.

Cap 18–50 mm. wide, more or less convex, sometimes plane, dirty brownish grey often with pinkish tinge, smooth, hispid at disk, breaking up irregularly towards margin into fine squamules showing white flesh between; *gills* white, scarcely crowded, free and more or less separated from the stipe; *stipe* 30–60 × 2–5 mm., sub-equal or attenuated upwards, pinkish brown, more or less silky fibrillose, sometimes subsquamulose or floccose below; *ring always evident, membranous*, floccose-tomentose, pale pinkish brown; *spores* white in mass, ellipsoid, 7–10(11·5) × 4·0–4·7 μ; basidia 4-spored, 21–29 × 7·5–8·5 μ; *gill edge* with ventricose-fusiform hairs 4–8 μ wide; *trama* of gill made up of more or less interwoven cylindrical hyphae 4–8 μ wide; *cap cuticle* at disk of *long, erect, aseptate hairs* 10–12 μ wide, *below which are swollen hyphae forming an ill-defined hymeniform layer*; *clamps present*; *flesh* white or whitish; *smell* absent or weak and then pleasant. On bare ground. Type: Windsor Great Park 18 Oct. 1957.

Observations. This is evidently the species described by Kühner in *Bull. Soc. mycol. Fr.* **52** (1936), 221, without a Latin description.

Lepiota sublittoralis sp.nov.

Pileo 35–55 mm. lato, sub-globoso, sericeo-levi sed paucis floccis veli universalis obtecto, dilute brunneolo-incarnato, pallidiore ad marginem, denique campanulato-convexo vel convexo-subumbonato et in floccoso-squamis secedente, disco levi; lamellis liberis ab stipite remotis, sub-ventricosis, albidis, acie denique flocculoso; stipite 65–110 × 3·5–5·0 mm. ad apicem, sub-clavariforme, 13 mm. ad basim, albido, sericeo-levi, farcto; annulo membranaceo albido; sporis in cumulo albis, amygdaliformibus 6·7–7·2 × 3·5–4·5 μ, dextrinoideis; basidiis 4-sporis, clavariformibus 29 × 8 μ; acie lamellarum pilis obtusis, plus minus ventricosis vel fusiformibus 9–12 μ latis; trama lamellarum laxa, ex hyphis intermixtis 20–22 μ latis composita; cute pilei ex hyphis jacentibus 3·5–5·5 μ latis instructa, et pilis elongatis numerosis clavariformibus 10–19 μ latis ferente; hyphis fibuligeris nullis. Inter foliis mortuis in silvis frondosis. Typus: Windsor Great Park, Berks, 18 Oct. 1957, in Herb. Hora.

Cap 35–55 mm. wide, at first more or less subglobose and *silky smooth but for a few flecks from the universal veil*, pale flesh-brownish, pallid towards the margin, finally campanulate-convex to convex-umbonate, the cuticle breaking up into small flecks and squamules but the disk remaining smooth; *gills* rather widely separated from the stipe, subventricose, whitish, edge finally flocculose; *stipe* 65–110 × 3·5–5 mm. at apex, subclavariform, 10–13 mm. at base, whitish, smooth, silky, stuffed; *ring membranous*, whitish; *spores* in mass white, amygdaliform, 6·7–7·2 × 3·5–4·5 μ, dextrinoid; *basidia* 4-spored, clavariform 29 × 8 μ; *gill edge* with obtuse, more or less ventricose or fusiform hairs 9–12 μ wide; *trama of gill* lax, of interwoven cells 20–22 μ wide; *cuticle* of cap made up *of repent hyphae* 3·5–5·5 μ wide and *bearing numerous obtuse, elongated, colourless, clavariform or fusiform hairs* 10–19 μ wide; *clamps absent.* Amongst dead leaves in deciduous woods. Type: Windsor Great Park, 18 Oct. 1957, in Herb. Hora.

Observations. This is evidently the species described by Kühner in *Bull. Soc. mycol. Fr.* **52** (1936), 216, without a Latin diagnosis. The toadstool has turned up in scattered areas in this country and is probably widely distributed. I have specimens from Norbury Park (Surrey), first gathered 2 Oct. 1954.

LIMACELLA

Limacella roseofloccosa sp.nov. (Fig. 7)

Pileo 28–70 mm. lato, carnoso, sub-viscoso, convexo-expanso, umbonato, circum umbonem depresso, plus minus dilute roseo-brunneolo, disco fusco vel fuligineo, ad marginem saepe velo lacero dentiformi cincto, margine interdum sub-sulcato, cuticula (sicca) breviter hispida sub lente, partim separabili; lamellis albis, liberis vel adnexis, sub-confertis, plus minus ventricosis, acie levi vel lacero; stipite 30–60 × 4·5–10 mm., aequali, sicco, interdum deorsum attenuato, ad apicem sericeo-striato, dilute incarnato, deorsum squamis floccosis in forma cingulorum depositis, ad basim albo-tomentoso; annulo incarnato, floccoso; carne sub-fragili, albo, sub cuticula roseo; sapore insipido;

odore sub-nullo, non farinae revocante; sporis in cumulo albis, globosis, 4–4·5 μ, fortiter dextrinoideis; acie lamellarum cellulis numerosis basidiformibus 4–6 μ latis; cuticula pilei ex hyphis jacentibus instructa (3)4–6(10) μ latis, interdum ramosis; trama lamellarum bilaterali. Inter foliis praecipue in silvis frondosis: Typus: Gomshall, Surrey, 25 Sept. 1954 in Herb. Kew.; Mickleham Downs, Surrey, 22 Oct. 1954; legit P. D. Orton.

Cap 28–70 mm. wide, fleshy, somewhat viscid, convex-expanded, depressed round the umbo, *pinkish buff* but dark brown or darker towards centre, the margin appearing torn with remains of the veil and sometimes shallowly grooved, the cuticle of the disk (when dry) somewhat *stippled-hispid* and separable to about half-way; *gills* white, free or adnexed, subdistant and more or less ventricose, edge smooth or torn; *stipe* 30–60 × 4·5–10 mm., dry, equal or attenuated below, pale pinkish, apex silky striate, concentrically floccoso-scaly below ring, base white tomentose; ring pink, floccose; *flesh* rather fragile, white but pinkish below the cuticle; *taste* insipid; *smell* slight, not of meal; *spores* in mass white, *globose*, 4–4·5 μ apiculate, *strongly dextrinoid*; edge of gill with basidiform cells 4–6 μ wide; *cuticle* of cap filamentous, hyphae (3)4–6(10) μ wide and sometimes branched; *trama* of gills divergent. In woods, mainly deciduous, amongst leaves. Type: Gomshall (Surrey), 25 Sept. 1954, in Herb. Kew; Mickleham Downs (Surrey), 22 Oct. 1954, legit P. D. Orton.

Observations. The white spores, divergent (bilateral) gill trama and more or less viscid cap place this toadstool in the genus *Limacella*. It is evidently close to *L. glioderma*, but my own gatherings of this latter species have always been characterized by a strong mealy taste and smell and by having non-dextrinoid spores. Fries, in *Hymenomycetes Europae*, p. 39, places *Agaricus* (Lepiota) *delicatus* immediately after *A.* (L.) *glioderma*. The two are certainly very similar and Kühner, indeed (*Bull. Soc. mycol. Fr.* **52** (1936), 200–201), regarded them both as forms of *Limacella glioderma*. *L. roseofloccosa* is certainly specifically distinct if only because of the dextrinoid spores. In Helen V. Smith's paper: 'The genus *Limacella* in North America' (*Pap. Mich. Acad. Sci.* **30** (1945), 139), *L. rosefloccosa* would evidently come very close to *L. roseola* Murrill emend. H. V. Smith, which also has a dry stipe (Sect. Viscidae) and strongly dextrinoid spores, and which does not seem to have been re-collected since Murrill's original gathering at Lynchburg, Virginia, Sept. 1926. *L. roseola*, however, is a much more slender agaric with an upwards tapering stipe longer than the cap diameter, and the entire fruiting body is rose pink.

MICROMPHALE

Micromphale cauvetii sp.nov.

Pileo 20–40 mm. lato, carnosulo, e convexo-plano vel depresso, hygrophano, fusco-rufescente vel rufo-ochraceo margine pellucido-striato pallidiore (udo), expallente (sicco); lamellis sub-confertis, inaequalis, secedenti-liberis, albis rufescentibus; stipite 30–70 × 2–3 mm., aequali vel deorsum attenuato, cartilagineo, sursum pallido, deorsum nigro-fusco vel atro, fistuloso, levi, primitus pruinoso; odore et sapore alliaceo forte, sporis in cumulo albis, ellipsoidalibus vel amygdaliformibus $5\frac{1}{2}$–$6\frac{1}{2}$ × 3–$3\frac{1}{2}$ μ, levibus, non amyloideis; basidiis 4-sporis; hyphis cuticularibus jacentibus 8–12 μ latis; mucilagine intercellulari carnis pilei plus minus manifesta; hyphis ad septas fibuligeris. In scobe pini. Typus: Benyon's Enclosure, Mortimer, Reading, Berks, 10 Oct. 1949 (legit T. M. Harris, F. B. Hora), in Herb. Hora.

Cap 20–40 mm. across, convex then flat or depressed, hygrophanous brownish red to reddish ochre, paler at the more or less striate margin when wet, expallent; *gills* somewhat distant, unequal, adnexed or free, white then pale buff; *stipe* 30–70 × 2–3 mm., equal or attenuated below, cartilaginous, pale above, blackish downwards, smooth, hollow, pruinose when young; *taste* and *smell* strong *of garlic*; *spores* in mass white, ellipsoid or amygdaliform $5\frac{1}{2}$–$6\frac{1}{2} \times 3$–$3\frac{1}{2}\,\mu$, smooth, non-amyloid; *basidia* 4-spored; *cap cuticle* of repent, filamentous hyphae 8–12 μ wide; *flesh of cap with intercellular mucilage* more or less evident; clamps present. In pine sawdust. Type: Benyon's Enclosure, Mortimer, numerous tufted specimens, 10 Oct. 1949 (legit T. M. Harris, F. B. Hora), in Herb. Hora.

Observations. This species was first published as *Marasmius cauveti* Maire & Kühner in *Ann. Soc. linn. Lyon*, **79** (1936), p. 2, without a Latin description. Placement in *Micromphale* is made because of a combination of characters including the smooth repent hyphae of the cap cuticle, the gelatinized context, and the strong, almost foetid, smell.

The Mortimer specimens are the only ones I have seen so far. Some of these, sent to the late A. A. Pearson, were identified with *Marasmius cauveti* by Prof. Kühner.

MYCENA

Mycena pudica sp.nov.

Pileo membranaceo, tenui, 1–10 mm. lato, candido, initio convexo umbilicato, dein sulcato, rare papillato, margine crenulato, sicco, pubescente; lamellis distantibus, non plicaeformibus, albis, adnatis, linearibus vel arcuatis, acie (sub lente) denticulatis; stipite capillari, brevi 0·7–3 × 0·1–0·3 mm., stricto vel incurvo, pubescente, basi saepe bulbilloso; sporis in cumulo albis, levibus, obovoidibus, lacrimiformibus vel sub-fusoideis 11–13 × 4–6 μ, amyloideis; cheilocystidiis ventricosis, obtusis, saepe capitatis apice interdum furcato 30–70 × 7–13 μ; cute pilei stipitisque ex hyphis numerosis cylindraceis, capitatis vel sub-globosis. Hab. catervim, in mortuis plantarum paludosarum praecipue Moliniae caeruleae, nec non specierum Caricis et Rubi, etiam Cladii. Typus: Ferry House, Windermere, 30 May 1954, in Herb. Hora.

Observations. This is the toadstool which was first described as *Omphalia quisquiliaris* Josserand in *Ann. Soc. linn. Lyon*, **60** (1937), 88, without a Latin diagnosis and later transferred to *Mycena* by Kühner (*Le Genre Mycena* (1938), p. 388). Both binomials are illegitimate. An English description by A. A. Pearson, based on British specimens, appeared in *Trans. Brit. mycol. Soc.* **29** (1946), 193. *M. quisquiliaris* Berk., 1842, is different.

Mycena oortiana sp.nov.

Pileo 10–15 mm. lato, conico-campanulato, primitus fusco-brunneo dein albo et delicate olivascente, striato-sulcato; lamellis confertis, adnexis, postice angustibus, ex albido rosellis, acie denticulatis; stipite 20–40 × 1–$1\frac{1}{2}$ mm. aequali, polito, lilacino-griseo, juventute obscuriore, fistuloso, ad basim tomentoso; carne pilei albida, stipitis grisea; odore fortiter iodiforme; sapore mite; basidiis 4-sporis; acie lamellarum sterile, ex cellulis numerosis echinulatis clavatis vel pyriformibus 12–14 μ latis composita; sporis in cumulo albis, ellipsoidalibus $7-8 \times 4\frac{1}{2}-5\,\mu$, guttula una, levibus, amyloideis. Hab. caespitosus ad truncos Sambuci ebuli, etcetera. Typus: Pendley Manor, Tring, Herts, 14 May 1955, in Herb. Hora.

Observations. This toadstool, first referred by Oort (1928) to *Mycena arcangeliana* Bres., was described under the name *M. arcangeliana* var. *oortiana* by Kühner in *Le Genre Mycena* (1938), p. 297, without a Latin diagnosis, the variety being based on, among other things, the presence of pleurocystidia. An English description by A. A. Pearson and coloured plate of material collected by Dr Dennis appeared in *Trans. Brit. mycol. Soc.* **29** (1946), 193. Pearson was clearly of the opinion that the toadstool deserved specific rank. I have now made this change of status and given a Latin description of the species.

MYXOMPHALIA gen.nov.

Habitus omphalioideus vel clitocybeoideus. Pileo submembranaceo saepe hygrophano et striato, glabro, (udo) atro-umbrino-brunneo rare albo, (sicco) pallescente, convexo-plano, plus minus profunde umbilicato; lamellis candidis, confertissimis, adnatis decurrentibus, arcuatis; stipite rigido saepe fistuloso, cum pileo concolore, a pileo non distincto; sporis albis, membrana plus minus levi, amyloidea; cute pilei ex hyphis filamentosis composita; carne non vel haud amyloidea; trama lamellarum regulari vel subregulari; cystidiis saepe cylindraceis, numerosis ad aciem sed rarioris ad laterem lamellae; pleurocystidiis interdum nullis; hyphis ad septas fibuligeris. Praecipue in silvis coniferis ad terram adustam. Species typica: M. maura (Fr.) Hora.

Habit of *Omphalina* or *Clitocybe*. *Cap* with almost membranous flesh, often hygrophanous and striate, smooth, when wet varying dark brown to almost black, very rarely white (albino forms), drying paler, convex to plane more or less umbilicate; *gills* white, very crowded, adnato-decurrent, arcuate; *stipe* rigid, often hollow, concolorous with cap, not separable from cap; *spores* in mass white, more or less smooth, amyloid; *cap cuticle* consisting of filamentous hyphae; *flesh* not or scarcely amyloid; *trama* of gills regular to subregular; *cystidia* often cylindrical, more numerous on the edge than side of gills, facial cystidia sometimes absent; clamps present. Mainly in coniferous woods on burnt ground. Type species: **M. maura** (Fr.) Hora comb.nov. (*Agaricus maurus* Fr., Syst. Mycol., 168, 1821).

Observations. *Myxomphalia* was the name created by Kühner (but without a Latin diagnosis) in *Le Genre Mycena* (1938), p. 535, for a section of *Mycena* to comprise *Agaricus* (Omphalia) *maurus* Fr., and he added a footnote saying that the section might well be raised to generic rank. I am sure this view is correct. Bigelow proposed *Myxomphalia* as a gen.nov. in *Canad. J. Bot.*, **37** (1959), 767, and made the new combination *M. maurus*, but in the absence of any Latin description both the genus and the binomial are invalid. Singer, in *The Agaricales* (1949) 1951, p. 348, placed *Myxomphalia* as a subgenus of *Fayodia* Kühner, including one other species first published as *Omphalia invita* Karsten. I do not know this species, but Singer examined the type (which is in Leningrad) and gave a short description (*Ann. Mycol.* **41** (1943), 62, footnote).

OMPHALINA

Omphalina rickenii sp.nov.

Pileo brunneo-griseo vel alutaceo-griseo, plus minus rugoso, striato, margine subcrenulato, hygrophano, sicco griseo, e convexo-umbilicato infundibuliforme, 5–25 mm. lato, sub-membranaceo, tenaci; lamellis pallide brunneolo-argillaceis, saepe ramosis et placeiformibus, decurrentibus, venoso-connexis; stipite cum pileo concolore, aequali 7–15 × 1–2 mm., glabro, farcto; sapore et odore nullo; sporis in cumulo albis, levibus, cylindraceo-ellipsoidalibus 6–9 × 3–5 μ, non amyloideis; cystidiis et fibuligeris nullis. Hab. in muris et locis graminosis et arenariis, saepe ad muscos adhaerens. Typus: Bear Wood, Wokingham, Berks, 25 Oct. 1955, in Herb Hora.

Cap brownish grey, to alutaceous more or less wrinkled-striate, margin somewhat crenulate, hygrophanous, grey when dry, at first convex-umbilicate then funnel-shaped, 5–25 mm. across, rather membranous, tough; *gills* pale brownish clay, *often branched* and *pliciform*, even interveined, narrow, decurrent; *stem* concolorous with cap, equal, 7–15 × 1–2 mm., more or less smooth, stuffed; *smell* and *taste* none; *spores* in mass white, smooth, cylindric-ellipsoid, 6–9 × 3–5 μ, *non amyloid*; *cystidia* and *clamps none*. Hab. on old walls, in grassy and sandy places, sometimes attached to moss. Type: Bear Wood, 25 Oct. 1955, in Herb. Hora.

Observations. This is *Omphalia muralis* sensu Ricken (*Die Blätterpilze*, 1 (1915), 388), for which Singer in *The Agaricales Lilloa*, (1949) 1951, p. 735, proposed the new name *Leptotus rickenii* (without a Latin description), preferring *Leptotus* Karsten because he did not consider the species a true representative of the Agaricales. I admit it is not easy to know where to draw the line, but the existence of species which connect the present one with what most agaricologists would regard as true representatives of the genus *Omphalina* leads me to include this species in *Omphalina*.

PANAEOLUS

Panaeolus rickenii sp.nov.

Pileo 5–20 mm. lato, hemispherico-acuminato, carnosulo, hygrophano, nigro-fusco, disco rufescente, pellucido-striato (udo), sicco alutaceo-brunneolo circa marginem nigricante zonato; velo, etim primitus, absolute nullo; lamellis plus minus adnatis, subventricosis, nigrantibus; stipite plus minus aequali, ad basim sub-bulbilloso 5–10 × 1–2 mm., deorsum rufescente, ad apicem pallidiore, undique pulverulento, fistuloso; sporis in cumulo atris 13–16 × 9½–11 × 9 μ, limoniformibus; sapore et odore nullo; cheilocystidiis plus minus capitato-clavatis; pleurocystidiis nullis. Hab. in locis graminosis, praecipue in pascuis stercoratis. Typus: Whiteknight's Park, Reading, Berks, 10 Sept. 1956, in Herb. Hora.

Cap 5–20 mm. wide, hemispherical acuminate, slightly fleshy, hygrophanous, blackish brown, the disk becoming somewhat reddish, *pellucid-striate* (when wet), drying to pale brownish with a *darker marginal zone when half dry*; *veil even in the youngest stages quite absent*; *gills* more or less adnate, sub-ventricose, finally black; stipe more or less equal, sub-bulbillose 5–10 × 1–2 mm., rufescent below, paler above, pruinose, hollow; *spores* in mass black 13–16 × 9½–11 × 9 μ, lemon shaped; *taste* and *smell* none; cheilocystidia more or less capitate-clavate; *pleurocystidia absent*. In grassy places, especially in well-manured meadows. Type: Whiteknight's Park, 10 Sept. 1956, in Herb. Hora.

Observations. This species has been generally known as *Panaeolus acuminatus* s. Ricken (*Die Blätterpilze*, 1 (1915), 268). Ricken's description fits the fungus well, but it is certainly not *P. acuminatus* (Schaef. ex. Secr.) Quél., an uncommon species which I have myself gathered. Accordingly, in *Naturalist, Lond.*, July–Sept. (1957), p. 82, I proposed the new name *P. rickenii* Hora, but without a Latin diagnosis, which is now provided.

PSEUDOHIATULA

Pseudohiatula stephanocystis sp.nov.

Pileo 15–20 mm. lato, convexo-plano, interdum plus minus umbonato, testaceo-gilvo, rare fusco vel griseo-brunneo, expallente; lamellis linearibus, plus minus adnexis, subconfertis, e pallidis dilute ochraceis; stipite 30–80 × 1–2 mm., tenaci, pallescente, aequali, radici strigoso-fibrillosa; sapore miti; sporis in cumulo albis 5–7(8) × 3–4 μ, non-amyloideis; cute pilei ex hyphis hymeniformibus circa 10–15 μ latis; cheilocystidiis et pleurocystidiis utriformibus (sensu Romagnesii), 30–65 × 10–25 μ, tunica tenue, apice incrustato; pileocystidiis longis tenuibusque; caulocystidiis cum cystidiis lamellarum sub-similibus. Hab. in pinetis ad conos, praecipue verno. Typus: Mortimer, Reading, Berks, 21 Apr. 1958, in Herb. Hora.

Cap 15–20 mm., convexo-plane, sometimes more or less umbonate, ochraceous or ochraceous brown, varying dark brown or grey brown, expallent; *gills* more or less crowded and adnate, white then cream ochraceous; *stipe* 30–80 × 1–2 mm., *taste mild*; *cuticle of pileus hymeniform*, the cells 10–15 μ wide; *spores* in mass white 5–7(8) × 3–4 μ, *non-amyloid*; *cheilocystidia and pleurocystidia thin walled, more or less utriform* (in the sense of Romagnesi), 30–65 × 10–25 μ with crystalline deposit; pileocystidia long and narrow; caulocystidia rather like the gill cystidia. On buried cones of *Pinus, mostly in spring.* Type: Mortimer, 21 April 1958, in Herb. Hora.

Observations. Although the *Marasmius conigenus* complex has been largely cleared up as regards the taxa involved, the nomenclature is not altogether satisfactory. The matter has been reviewed by D. A. Reid in *Kew Bull.* (1954) 2, 279–288. Species with an hymeniform cuticle to the cap are retained by Reid in *Marasmius*; my own view is that Singer is right in removing them to *Pseudohiatula.* Reid makes it plain that there are two epithets available, namely, *stephanocystis* Kühner & Romagnesi and *esculentus* subsp. *pini* Singer; neither was given a Latin description. In choosing the epithet of Kühner & Romagnesi I do so because theirs is the first unambiguous epithet *at the specific level.* Reid prefers Singer's nomenclature (although he did not validate it by providing a Latin diagnosis) and rejected that of Kühner & Romagnesi because they cited Konrad & Maublanc, *Icones Selectae Fungorum* (1932), pl. 206, fig. 1, which Reid says (*loc. cit.* p. 280) '. . . is most certainly not the fungus in the sense of Patouillard or Singer as it is clearly stated and figured as having fusoid cystidia.' Examination of the plate, however, shows fusoid, pointed, capitate, utriform, thick- and thin-walled cystidia, with and without crystalline deposits and, moreover, these are correctly referred to in the appropriate text. I have no doubt that the figured and described cystidia are drawn from more than one of the three closely related species. This is not surprising because Konrad & Maublanc did not recognize more than one of these three species (all with hymeniform cuticle and non-amyloid spores) which they called *Collybia tenacella*. The citation of these cystidia, therefore, is not evidence for acceptance or rejection of a particular name. I suspect the plate was cited by Kühner & Romagnesi solely for the paintings of the toadstools which could well represent *Pseudohiatula stephanocystis*. They could equally well represent *P. tenacella* Moser which has fusoid, pointed cystidia which are thin walled and encrusted. This latter interpretation is accepted by Reid except that he uses the combination *Marasmius tenacellus* (Pers. ex Fr.) Favre.

RUSSULA

In this genus, as in *Lactarius*, spores have been examined in Melzer's iodine solution: measurements were made from optical sections of the spore walls and exclude the ornamentation.

Russula betularum sp.nov.

Pileo carnosulo 20–50 mm., roseo-rubello, disco lutescens, plano depressove, margine demum sub-tuberculo-sulcato, carne sub pellicula separabili alba; lamellis sub-confertis, albis, acie levi, sinuo-adnexis; stipite 25–65 × 7–12 mm., albo, aequali; sporis in cumulo albis, 8–10 × $7\frac{1}{2}$–8 μ reticulatis vel sub-reticulatis (sec typum III Singeri), ornamentatione amyloideo $\frac{1}{2}$–$\frac{3}{4}$(1) μ); sapore acri; odore debile, mellem revocante; cystidiis pilei plus minus clavatis, numerosis, interdum cylindraceis (3)6–8 μ latis; cystidiis lamellarum plus minus cylindraceis, apice apiculato-acuminatis 5–7 μ latis; '$FeSO_4$' et solutione phenolica normaliter reagente; 'NH_4OH' negativus. In betuletis. Typus: Oxshott, Surrey, 5 Nov. 1958 in Herb. Hora.

Cap with little flesh, fragile, 20–50 mm. wide, deep rose pink at first, *discolouring to yellowish at the centre*, more or less plano-depressed when mature, margin somewhat tuberculate-sulcate; cuticle more or less sticky, *almost completely separable*, *underneath flesh white*; gills rather distant, white, *edge even*, sinuo-adnexed; *stipe* 25–65 × 7–12 mm., *longer than diameter of cap*, white, equal; *spores* in mass pure white 8–10 × $7\frac{1}{2}$–8 μ, reticulate or subreticulate (type III of Singer), ornamentation amyloid $\frac{1}{2}$–$\frac{3}{4}$(1) μ; *taste* acrid, *smell* faint but distinct, rather like honey; dermato-cystidia more or less clavate, numerous, a few cylindrical, (3)6–8 μ wide; *gill cystidia* more or less cylindrical, apex apiculate-acuminate 5–7 μ wide. $FeSO_4$ and phenol reactions normal; NH_4OH *negative*. In *birch* woods. Type: Oxshott, Surrey, 5 Nov. 1958 in Herb. Hora.

Observations. This is a fairly common species in this country and is always attached to birch. A. A. Pearson referred it to *R. fragilis* and this is the interpretation in the 'Revised List...' of Pearson & Dennis (these *Trans.* **31** (1948), 166). It differs from that species as understood in the new 'List' (1960) by a combination of characters including stipe being relatively long as compared with the cap diameter, the smooth edge to the gill and the centrifugal yellowing of the cap. Furthermore, it does not seem to occur away from birch trees.

I am sure that this is the toadstool described by Blum under the name

R. emeticella Singer in *Bull. Soc. mycol. Fr.* **72** (1956), 141, but reference to Singer's description shows that it cannot cover *R. betularum* which is accordingly described as new.

Russula knauthii (Sing.) Hora comb.nov.

This was first described by Singer in *Hedwigia* (1926), p. 216, as *Russula emetica* subsp. *fragilis* f. *knauthii*. It has been one of the guiding principles of the New Check List that taxa below the rank of the species are not recognized except in very special circumstances. We, therefore, have taken *R. knauthii* as a species, admittedly a weak one, close to *R. fragilis*, from which it differs in the cap being constantly lilac to purplish black towards the centre, the larger number of intermediate gills, the firmer texture and the slightly off-white spores which do not, however, reach B in the spore colour chart of Crawshay. In my gatherings, the spores measured 7½–9 × 6½–8 μ, the ornamentation being zig-zag, or forming a three-sided 'net' but not a closed or four-sided 'net'.

There have been suggestions that *R. knauthii* might be the same as *R. nigrodisca* Peck. The type material of this latter species has now been examined by Singer and he concluded (*Mycologia*, **35** (1943), 149): 'This plant (*R. nigrodisca*)...does not seem to be different from *Russula emetica* ssp. *alpestris* (Boud.) Sing....'

Russula polychroma sp.nov.

Pileo 50–120 mm. lato, e convexo expanso depressoque, plus minus omnicolor: purpuraceo, obscuriore rubello, brunneolo-rubro, viscido, nitido, levi, pellicula separabili, margine pectinato; lamellis antice rotundatis, sub-confertis, plus minus adnexis, demum ochraceis, acie pallidiore, saepe sub-glaucescentibus; stipite albo 30–90 × 15–30 mm., aequali; carne albo e solido spongioso; sapore miti; odore sub-nullo; sporis in cumulo ochraceis (G (H) Crawshayi) 9–11 × 7–9½ μ, spinulis separatis 1–2 μ altis (ornamentatione sec typum VI Singeri); cystidiis lamellarum numerosis ope sulphovanillini caerulescentibus; dermatocystidiis numerosis. In pinetis. Typus: Rothiemurchus, Scotia, July 1958, in Herb. Hora.

Cap 50–120 mm. wide, at first convex, finally more or less expanded depressed, *colours variable*: purplish, dull reddish, brownish red; viscid, shiny, smooth, pellicle separable, margin pectinate; *gills* round in front, subdistant, more or less adnexed, finally ochre, edge paler, often with glaucous tint; *stipe* white 30–90 × 15–30 mm., equal; *flesh* white, firm then spongy; *taste mild*; *smell* virtually none; *spores* in mass dull ochre (G (H) of Crawshay) 9–11 × 7–9½ μ, with isolated spines 1–2 μ (type VI of Singer), cystidia on edge and sides of gills numerous, becoming blue in S.V.; dermatocystidia numerous. In *coniferous* woods, not common. Type: Rothiemurchus, Scotland, July 1958, in Herb. Hora.

Observations. This species is usually determined as *R. integra* Fr. sensu Maire. Fries's concept of *R. integra* is collective and his name is best kept for the toadstool well described and figured by J. Lange (*Flora Agaricina Danica* v (1940), 78, and Fig. 196F). In this connexion, the article by Niolle, in *Bull. Soc. mycol. Fr.* **74** (1958), 111, is informative. *R. integra* sensu J. Lange differs from *R. polychroma* by being confined to deciduous woods, especially beech, and in having smaller spores, 7–8(9) × 5½–6(7) μ. *R. fusca*

Quél. has been suggested as an earlier name for *R. polychroma*. Quélet, however, has two descriptions of his species which suggest that he did not distinguish both of the above species. His earlier description is more like *R. integra* sensu J. Lange under which name, therefore, it should be placed as a synonym. For a fuller discussion, the article by Niolle already cited may be consulted. The binomial *R. polychroma* was suggested by Singer, but it was published as a *nomen nudum*.

Russula violaceoides sp.nov.

Pileo 40–60 mm. lato, sub-carnosulo, e convexo expanso depresso, viscidulo, sordide purpureo, interdum brunneolo intermixto, demum purpureo-violaceo, in centro saepe plus minus fuscescente, nitido, carne sub pellicula separabili plus purpureo, margine patente demum sub-tuberculoso-striato; lamellis aequalibus, confertis, sinuo-adnexis, ex albis pallidis; stipite 40–60 × 15–20 mm., plus minus aequali, albo, demum sub-cavernoso; carne fragili, albo, immutabili; sapore primus miti, mox in faucibus sub-acri; odore debile, mellem vel oleum caryophylli revocante; sporis in cumulo cremeis ('C, C+, Crawshay'), 7–8 × 6–6½ μ, ornamentatione amyloidea, verrucis, lineis anastomosantibus, plerumque reticulatis vel sub-reticulatis (sec typum III Singeri); cystidiis pilei numerosis, plus minus cylindraceis 50–70(100) × 3–5 μ; cystidiis lamellarum cylindraceis, ope solutione sulphovanillini plus minus caerulescentibus; reactione '$FeSO_4$' valde rubida; 'NH_4OH' nulla. Habitus in betuletis exoletis prope Rothiemurchus, Scotia. Typus Rothiemurchus, 17 June 1958, in Herb. Hora.

Cap 40–60 mm. across, flesh rather thin, convex then expanded depressed, dull purplish at first and sometimes with a wash of brownish in parts, finally purplish violaceous and often with the brownish wash more evident especially towards the centre, somewhat viscid, shining, pellicle separable almost to centre, the flesh showing purplish beneath, margin at length weakly tuberculate-striate; *gills* crowded, sinuo-adnexed, white then dull pale creamy; *stipe* 40–60 × 15–20 mm., at first slightly tapering upwards finally more or less equal and then somewhat cavernous; flesh fragile throughout; *taste almost mild at first, then subacrid*; *smell* faint but distinctive, *recalling overtones of honey, oil of cloves*; *spores in mass creamy* (C, C+ of Crawshay), 7–8 × 6–6½ μ, the amyloid ornamentation mostly warted and with anastomosing lines forming a complete or partial network (type III of Singer); *cystidia* numerous, more or less cylindrical 50–70(100) × 3–5 μ, those on gill similar, becoming blue in SV; reactions with $FeSO_4$ bright reddish, *with* NH_4OH *nil.* Habitat: in old, moribund *birch* woods, near Rothiemurchus, Scotland. Type: Rothiemurchus, 17 June 1958, in Herb. Hora.

Observations. This species looks rather like *R. brunneoviolacea*, but is most closely related to *R. violacea* forma *smaragdina* J. Schaeffer from which it differs in the absence of the ammonia reaction. It has not the long (1–2 μ) spines on its spore which are a feature of *R. brunneoviolacea*.

TRICHOLOMA

Tricholoma obscurissimum (Pearson) Hora comb.nov.

Basonym: *T. ionides* var. *obscurissima* Pearson (*Trans. Brit. mycol. Soc.* **29** (1946), 192). Synonym: *T. conicosporum*, Métrod in *Rev. Mycol., Paris*, **4** (1939), 107, without a Latin diagnosis.

T. ionides has a violaceous, lilac or purplish cap, somewhat recalling *Lepista nuda*, whereas *T. obscurissimum* has a predominantly grey-brown cap rather like *Melanoleuca vulgaris*. It also differs by growing in troops, sometimes in circles, and seems to be confined to coniferous woods.

(*Accepted for publication* 10 *May* 1959)

PROCEEDINGS, 1959

MEETINGS

14 July 1959. Meeting held in the Department of Engineering, University of Bristol, at 9.30 a.m. Dr R. V. Harris, Chairman of the Plant Pathology Committee, in the Chair.

M. J. Carlile. The effect of light on fungi.

Since fungi lack the chlorophyll and photosynthesis of green plants (which obscure quantitatively minor responses) and the complex structure and behaviour of animals, they are particularly suitable for studies on the biological effects of light. Moreover, photobiological studies on fungi may advance our understanding of growth and reproduction since both are affected by light in many fungi.

Daylight stimulates the formation of orange pigments (carotenoids) and macrospores in *Fusarium oxysporum*. It was found, however, that whereas the visible component of daylight was particularly effective in bringing about carotenoid formation, ultraviolet radiation was more potent in inducing macrospore production. By selection of wavelength and time of exposure, it was possible to obtain macrospores in the absence of carotenoids, or carotenoids in the absence of macrospores. Visible light is effective in promoting both carotenoid production and apothecia formation in *Pyronema confluens*, but an albino mutant was obtained in which light would cause reproduction without bringing about carotenoid formation.

These results, and those of other workers on *Phycomyces* and *Pilobolus*, dispose of two popular concepts; that the presence of a carotenoid in a photosensitive structure is good evidence for it being the photoreceptor substance, and that the undoubted correlation between carotenoids and reproductive structures is evidence for carotenoids having an essential role in reproduction.

A. T. K. Corke. Experiments on *Gloeosporium* spp. on apple.

Experiments at Long Ashton have shown that while wounds on young branches of Cox's Orange Pippin trees are normally susceptible to infection by spores of *Gloeosporium perennans* only during the dormant season, the cut tips of shoots are more or less susceptible throughout the year. Although the extent of the infection is subject to the same host reactions as are sufficient to prevent the infection of bark wounds during the summer, the normal healing process may be adversely affected by seasonal conditions.

Spore production from infected shoots is greatest from cankers induced during the dormant period, and continues throughout the year, reaching a peak during the summer. Since rain is needed for spore dispersal, some influence is exerted on dissemination, although no direct relation has been established.

The susceptibility of Cox's Orange Pippin apples is influenced by cover crops, and by the level of nitrogen applied to the trees on which the fruits are borne.

B. B. Till and L. J. Hooper. Disease control in watercress.

The principal diseases are those due to virus (possibly a strain of cabbage black ringspot virus), and crook root disease incited by root infection with the fungus *Spongospora subterranea* (Wallr.) Lagerh. f.sp. *nasturtii* Tomlinson.

The virus problem has been serious on some farms but is now largely under control, owing to the increased use of seed propagation.

Control of crook root has been the object of collaborative work between Plant Pathology and Chemistry Departments, N.A.A.S. Headquarters, Bristol, for some years.

Various fungicide materials were tried without success until, in the 1956–57 season, some apparent control of the disease was achieved with dilute sodium hypochlorite, which was drip fed into the source water. In subsequent seasons the use of this material has been studied at a number of farms, with a view to elucidating the mode of action of the chemical, the optimum dosage level, and the best way of ensuring good distribution of the chemical in watercress beds. Preliminary results have indicated that the optimum level of hypochlorite is probably between 0·1 and 0·2 parts per million (of chlorine) in the source water. Root systems which have been subjected to this level of treatment show considerably less crook root disease than untreated root systems, and this difference is reflected in the vigour of the plants, and in the amount of crop produced.

Further trials are to be undertaken with sodium hypochlorite, with the twofold object of confirming results already obtained, and ensuring that effluent water from treated beds is harmless to fish. Until the latter point is satisfied, the method cannot be recommended as a commercial treatment.

L. Ogilvie and I. G. Thorpe. Observations on black rust of wheat in south-west England.

This paper is concerned with investigations on the epidemics of black rust (*Puccinia graminis*) which occur practically every year in the south-west of England and with the co-operative observations initiated in England and Western Europe in 1958. The detailed results obtained by several workers will be presented at a special symposium of the B.M.S. in October 1960. The present paper described very briefly the scope of the inquiry (role of barberries, timing of epidemics, aerobiology, races involved, etc.) and the features of the epidemics of 1958 and 1959.

9 October 1959. Meeting held at Birkbeck College, London, W.C.1, at 11.0 a.m. with the President, Dr P. W. Brian, in the Chair.

R. C. F. Macer. Further observations on the saprophytic and parasitic behaviour of *Cercosporella herpotrichoides*.

Preliminary observations upon *Cercosporella herpotrichoides* Fron., the fungus causing the eyespot foot rot of cereals, indicated that it possessed a very low competitive saprophytic ability. Although the root systems of diseased plants are not usually attacked, it was found that *C. herpotrichoides* showed many similarities with the root-inhabiting fungi. It could therefore be placed conveniently with this group in the ecological classification of root-disease fungi suggested by Garrett in 1950. Using the 'Cambridge method' of assessing competitive saprophytic ability, further evidence supporting this conclusion has been obtained.

Lucas in 1955, working with *Ophiobolus graminis* (Sacc.) Sacc. which is also a fungus of low competitive saprophytic ability, reported that when nodal straw was colonized in competition with the soil microflora the leaf-sheath acted as a zone of competition. The degree of colonization of the stem was consequently lower than that of the surrounding sheath. This observation has been confirmed, and by extending the zone of competition from a single leaf-sheath to three concentric layers of internodal straw the leaf-sheath effect was intensified. Experiments with *C. herpotrichoides* have shown a similar but more marked leaf-sheath effect. No such effect was found with *Fusarium culmorum* (W. G. Sm.) Sacc., a vigorous competitive saprophyte; in some experiments with this fungus the intensity of colonization of the inner layers of straw exceeded that of the outer layers. *F. culmorum* is thus able to compete successfully with other fungi in each successive straw layer. *C. herpotrichoides* was further shown to be more restricted in competitive saprophytic ability than *O. graminis* and it is therefore unlikely to have a free-living existence in soil or to be an active colonizer of plant debris in competition with soil saprophytes.

During the years 1954–59 observations upon the eyespot disease have been made using a mass inoculation technique which closely simulates natural dispersal of the fungus and which produces uniform infection over a large area. Consistent differences have been found each year in wheat between the resistant variety Cappelle Desprez and the susceptible variety Yeoman, although the intensity of the disease has varied from year to year as spread depends upon the weather conditions. None of the many wheat varieties tested by this method was found to be more resistant to eyespot than Cappelle Desprez, but some selections from crosses between this variety and the susceptible varieties Holdfast and Yeoman were found to be as resistant as Cappelle Desprez. In assessing resistance to this disease three criteria have been used: (1) percentage of severe eyespot lesions (producing mechanical weakening) on the bases of earing stems at anthesis; (2) lodging at commencement of ripening, (3) reduction of yield and 1000 corn weight between inoculated and uninoculated plots.

In small-scale replicated trials, losses in yield have ranged from 1·5 % in Cappelle Desprez to 20·9 % in Yeoman and 33·4 % in Yga Blondeau. Significant linear regressions were found between severe infection and loss in yield, and between lodging and loss in yield. In the favourable summer of 1959 a linear regression was found also between severe infection and lodging, but in the previous years it seems that this relationship was obscured by other factors affecting lodging such as straw type, straw length and environmental conditions, which were relatively more important.

P. G. Mantle. Hypersensitivity of wheat to loose smut.

A hypersensitive reaction of spring wheat seedlings attributed to Loose Smut (*Ustilago tritici*) was reported by Oort in Holland in 1944. Similar wheat/smut combinations to those used by Oort have been investigated anatomically and a direct relationship found between hypersensitive symptoms and fungal penetration of the plumular bud of the embryo, that is, all the tissues above the level of insertion of the coleoptile. The reaction of the subsequent plant varies according to whether the fungus enters the dome-shaped apical growing point or fails to penetrate beyond the level of the first or second leaf insertion. The main symptoms are stunted growth and leaf chlorosis. Distorted tissues are often present. Where mycelium has reached the apical growing point, the meristem has little or no further activity. Thus one to three leaves may emerge but the main axis dies. The seedling may recover by an uninfected bud developing in the axil of the coleoptile or of a leaf to give a healthy tiller. Where mycelium enters the plumular bud but fails to reach the apical growing point the symptoms are less severe. After a slow start the main axis may grow on to produce a healthy ear. Thus, plumular bud infection may, in certain combinations, result in seedling mortality. Hypersensitivity has been recently found in some spring and winter varieties infected with races present in this country. The previous classification of such combinations as embryo susceptible though field resistant did not allow for seedling mortality, as hypersensitive seedlings rarely emerge in the field unless the seed is sown in early summer. Hypersensitivity is most clearly observed under glasshouse conditions.

B. Deverall. A study of the growth of *Botrytis* spp. in leaves of field bean.

Using the chocolate spot disease of field beans caused by *Botrytis fabae* and *B. cinerea*, a study has been made of the effects of numbers of spores in the infection drop, the addition of nutrients to the spores and the nutrition of the host plant on infection and lesion spread in leaves. The growth of host plants and pathogens is standardized. Detached leaves are inoculated with drops of spore suspension of prearranged concentration, delivered from an 'Agla' micrometer syringe. Single spore inocula were produced by a technique involving the handling of spores on disks of 1·5 % pyridine-washed agar. Leaves were incubated under standard conditions of humidity at 15° C.

With a given number of spores, *B. fabae* was more likely to produce a lesion than was *B. cinerea*. Increasing the number of spores increased the probability of lesion development and spread. Many inoculation drops containing 500 spores failed to produce lesions. There were important differences between plants and leaves in susceptibility. A single spore could cause a lesion, but the probability depended greatly on plant and leaf.

Lesion production and spread were doubled in calcium-deficient plants as compared with plants on complete nutrient. Plants deficient in magnesium, potassium and phosphate also tended to be more susceptible.

Of an extensive range of carbohydrates and nitrogen compounds, only the sugars had a marked effect on infection when used as the suspending medium. Glucose and mannose made lesion production almost certain with 10 spores in a drop. Xylose reduced the probability of lesion establishment and prevented spread. Liquid culture experiments showed that 0·05 % glucose facilitated the growth of *B. fabae* on 1 % xylose, a similar amount of growth then being produced as on 1 % glucose.

The two fungi have been compared *in vitro* for activity of polyphenoloxidase, cellulase and pectic enzymes. Inactivation of the latter by bean leaf extracts is being studied. The apparent correlation between leaf degeneration after detachment and lesion spread is under consideration.

ANNUAL GENERAL MEETING

Saturday, 5 December 1959. The sixty-third Annual General Meeting was held in the rooms of the Linnean Society of London at 2.0 p.m. with the President, Dr P. W. Brian, in the Chair.

After the Minutes of the previous Annual General Meeting had been read and signed, the President recorded with regret the deaths during the year of Mr W. J. Finnegan, Mr F. C. Hassell, Mr H. V. Rose and Mr C. Sisley. He then briefly reviewed the year's activities.

The Treasurer presented his Annual Statement which was accepted *nem. con.*

The following Officers, members of Council and members of Committees were elected for 1960: *President:* E. C. Large; *Vice-President:* Mrs F. L. Balfour-Browne; *Treasurer:* W. Buddin; *Secretary:* J. G. Manners; *Foray Secretary:* Mrs S. M. Francis; *Plant Pathology Committee Secretary:* R. J. W. Byrde; *Editors:* S. D. Garrett and Miss G. M. Waterhouse; *Members of Council:* N. A. Burges, J. C. Gentles and S. A. Hutchinson (retiring members, R. V. Harris, D. M. Henderson, C. T. Ingold); *Member of Foray Committee:* Miss M. L. Chalk; *Members of Plant Pathology Committee:* F. T. Last, R. C. F. Macer, Miss F. J. Moore and J. Tomlinson.

The President, on behalf of Council, then moved that the proposed new Rules already circulated should replace the existing Rules of the Society. This motion was carried *nem. con.*, and it was also agreed that the new Rules should be submitted to a Special General Meeting, to be held in March 1960, for ratification.

The President elect, Mr E. C. Large, then took the Chair, and the President gave his address, entitled 'Griseofulvin'. A vote of thanks to the President for his address was moved by Dr Hawker and carried with acclamation.

REVIEWS

Plant Pathology. An Advanced Treatise. Vol. I. *The Diseased Plant.* Edited by J. G. Horsfall and A. E. Dimond. (New York and London: Academic Press, 1959.) Pp. xiv + 674, illustrated. Price $22.00.

The publication of this volume, soon to be followed by two others of similar dimensions, marks a definite stage in the advancement of plant pathology as a scientific subject. Clearly the study of plant disease, in its many ramifications, has now progressed so far as to be beyond the compass of any one man to deal adequately with it. Hence a treatise divided up into a large number of chapters, each of which covers a certain field of activity and is written by a specialist. In that respect it is comparable to those formidable volumes (chiefly in German) which covered the field of botanical taxonomy and which took shape about a hundred years ago.

To quote from the editors' Preface, this work 'treats of the concept of disease, not of diseases'. It is essentially an up-to-date review of what is known about the processes concerned in plant disease: how the disease-causing organism (if there is one) lives and how it reaches the plant, by what means it attacks and what the plant can do in defending itself, what damage is produced, by what means the losses due to disease can be mitigated or even prevented, and so on. Much of the present-day knowledge of these matters is of comparatively recent origin, so that the editors can say truly 'The present treatise could not have been written 25 years ago'. The reader will often feel—and will in fact be told—that much still remains to be unravelled, or even that very little is yet known, in many of the fundamental aspects of disease causation. Those of us, therefore, who live to see the 1985 edition of 'Plant Pathology' need not be at all surprised if the then editors likewise express themselves in the very words just quoted. Plant pathology is in an actively growing state and it is not likely that successive editions of this work will show the same stability as their morphological-taxonomic counterparts, 'Engler and Prantl' for example.

The whole subject (to quote again) 'dissected easily' into three segments: The Diseased Plant, The Pathogen, The Diseased Population—corresponding to Vols. I, II and III respectively of the treatise. One does not feel so sure about the easiness of the dissection. Physiological processes are far from being so cut-and-dried and self-contained as major taxonomic divisions. In particular, all those chapters in vols. I and II which deal with the interactions of host and parasite must have a great deal in common. It may in fact be held that a discussion of the action of a parasite is very much *in vacuo* without simultaneous discussion of the reaction of the host. The two are just aspects of the same process. The further sectioning within the volume will also meet with difficulties and this is apparent on reading: many of the chapters have common ground with others; one contributor indeed notes that his topic verges on five others in the volume. But to draw attention to this is not to criticize. A certain amount of interweaving is both inevitable and desirable and, after all, some repetition is often advantageous to the reader, especially when the subject is approached from a different angle.

The fifteen chapters of vol. I, which fairly evenly divide the book between them, may be taken in groups. Three of them are of a somewhat general or preliminary kind. First there is a chapter on the scope of plant pathology, its dependence on other sciences—chemistry, physics, meteorology, etc., and, of course, various branches of biology—and its sociological effects, both as to the past and to the future. This is a clear and straightforward account. Next comes a short history of plant pathology, from the time of Theophrastus down to the early years of the present century and ending with a sketch of the more recent intensive development. A particularly pleasing feature of this account is the appreciative treatment given to the work of some of the early pioneers—men like Tillet and Prévost—whose views were far too advanced for acceptance, or even much notice, in their day and generation.

The third chapter of a general kind has the peculiar title 'How sick is the plant?', a title rendered more peculiar perhaps to an English speaker on this side of the Atlantic who tends to bracket the idea of sickness with that of nausea. A more pertinent criticism of the title is that it conveyed, to one reader at least, no clear idea of what the contents might be. It is, in fact, a fairly elaborate review of methods of assessing disease intensity, first on the individual plant and then on the crop; of converting these measurements to amount of crop lost or damaged, and finally to amount of money lost. The subject, especially in the last-mentioned item, is immensely complex, with many variables and not a few incalculables. The author deals faithfully with these complexities and leads up to a plea for much greater effort in acquiring economic data of this kind. It is doubtful whether many governments will be led so far along this path as he would wish.

The central part of the book is occupied by the six chapters assigned to the major processes in plant disease. These are entitled: 'Tissue is disintegrated', 'Growth is affected', 'Reproduction is affected', 'The host is starved', 'Water is deficient', 'Alteration of the respiratory pattern in infected plants'. Here one finds a considerable variation in mode of treatment which can be illustrated by a comparison between nos. 2 and 3 of the foregoing list. In 'Growth is affected', the author limits himself to the discussion of excessive growth, so that he has a well-defined subject and one which has been and is being intensively investigated. After dealing concisely with a variety of effects—'bakanae' enlargement, root nodules, fungal and insectal galls, witch's brooms, etc.—he proceeds to describe, step by step, the recent researches which have thrown an entirely new light on the mechanism of gall formation by the crown gall organism. Both in mode of treatment and in interest of the processes described, this is one of the most successful chapters of the book.

The same cannot be said of the parallel chapter on reproduction. Growth and reproduction being equally fundamental in biology, a chapter on the one would seem as obvious as on the other. But the effect of disease on reproduction very largely follows automatically from the antecedent effect on growth, whether a parasite is concerned or not; or, as the author himself puts it, 'the plant as a whole must usually be considered in a discussion of the pathological aspects of reproduction'. Besides, there is no *special* plant pathology of reproduction, that is, so far as principles are concerned; flower parts are attacked and altered by the same mechanisms as are vegetative parts. No doubt there are special processes concerned in the smut diseases, but these are still unknown. With these limitations, this chapter takes the form of a lengthy and somewhat bewildering array of examples. More than half of the text is concerned with non-parasitic or 'physiological' diseases but, even so, treatment at the physiological level is scarcely attempted. And here it may be noted that this large and important group, some members of which—for example, molybdenum deficiency diseases—have been the subjects of intensive study, has to all intents and purposes fallen by the wayside in this volume. This is a serious omission in a treatise on plant pathology.

'Tissue is disintegrated' is a comprehensive and well-balanced account which inevitably deals at length with the enzyme systems responsible for breakdown of cell walls. It is equally inevitable that the mechanism of cell-killing should arise, so that there is much about toxins. Toxins and, to a less extent, cell-wall dissolving enzymes also figure prominently in 'Water is deficient' (a rather discursive chapter, this). The reader will no doubt be able to employ his time profitably by collating these accounts with the chapters entitled 'Chemical breaching of barriers' and 'Toxins' in volume II.

'The host is starved' and 'Alteration of the respiratory pattern in infected plants' can be taken together as both are mainly concerned with respiration. In the first of these, starvation of the host cell by an obligate parasite is shown to arise by the effect of the fungus on rates of photosynthesis and respiration, the net result being that after some days the latter considerably exceeds the former, so that there is no surplus for transport to reserve organs or growing points. Hence the impoverishment of the whole plant. This broad effect can readily be accepted, even though some of the evidence may be queried, either in substance or in interpretation. In both of these chapters great emphasis is placed on the increased respiration of infected tissue. This may well be a real effect, but it is very doubtful that the figures quoted in the several tables give anything like a true measure of it. The reader will certainly wonder by what means it is possible to assign the respective shares of fungus and host tissue *per se* in these figures, at any rate where an obligate parasite is concerned. Not that this distinction is important for the argument of the first-named chapter, as the heavy loss of metabolites, by whatever agency, is the main point; but it is fundamental to an hypothesis, put forward in the second, of a special parasite-induced respiratory cycle which is presumed to lead to the formation of anti-parasite substances in the host cells. When one calls to mind the hypersensitiveness phenomenon—how widely prevalent it is and how the speed of its action strongly suggests that the necessary components are already present at the time of invasion—one may well doubt the need, or the likelihood, of such an hypothesis.

Four chapters are assigned to disease resistance in its several aspects. 'Predisposition', though printed last of the four, is logically the first, inasmuch as it maps out the ground. It gives a methodical and critical review, with a bibliography of nearly 300 references, of the extensive and sometimes rather vague literature on this subject and by so doing it establishes itself as among the most valuable in the book. Anyone who wishes to start work in this field need go no further back than this chapter.

'Histology of defense in plants' deals with the well-known effects of cuticle, cork and gum barriers, etc., in limiting invasion by parasites; also with the less well-known callosities, lignitubers and haustorial sheaths. There are some very good illustrations of the latter group. The manner of their formation is strongly indicative of a local stimulation caused by a chemical exudate from the fungal hypha, and it would seem to offer a nice problem for a cell physiologist interested in the mechanism of cell wall deposition.

Two other chapters, 'Physiology and biochemistry of defense' and 'Hypersensitivity' round off the picture of natural defence against disease. In the first of these the view is stated that anti-parasite substances already present as such in the normal host tissue are only exceptionally responsible for resistance; much more generally, resistance comes into being after the parasite has invaded. What specific substances are actually concerned is still very uncertain, though polyphenol-oxidase systems are receiving much attention in this regard. The discussion is clear and constructive, and has affinities with the views advanced in the chapter on respiration.

'Hypersensitivity' is another stimulating contribution: first, an excellent assessment of the literature, then an account of recent work on certain effects shown in some facultative parasite-host associations, for example *Phytophthora infestans* and resistant varieties of potatoes, effects which 'have all the earmarks of a hypersensitive reaction, histologically speaking', as the author guardedly expresses himself. There is little doubt that the best hope of elucidating this important reaction lies in work along those lines.

The chapter 'Therapy' stands somewhat on its own but is placed next to those on defence mechanisms because most of it is concerned with the possibility of reinforcing any natural resistance present in the host tissue by the internal administration of chemotherapeutant substances. The many serious difficulties so far met with in attempts to control disease by such means are fully described.

There remains the editorial prologue 'The diseased plant'. Comment on this has been delayed thus far, as the reviewer was frankly at a loss what to say about it. The last two pages of it deal with the general planning of this volume. So far so good, but, as for the remainder, one really wonders why it was written at all. One feels driven either to write a great deal or to pass it over completely; but something intermediate must be attempted. There is the jaunty repetitive style, which may amuse some readers but not others, and the many allusions which will be hardly intelligible to foreigners—not the sort of thing that should occur in a treatise intended for international circulation. As to the substance: the editors apparently have an urge for heresy hunting, and they see to it that they find some heretics. Two examples will suffice, one trivial and the other not so trivial. They object to a person saying that he 'catches a disease' when the only thing he can catch is a ball or some such material object. 'Catch' is not to be allowed to follow the linguistic principle of taking on a derived meaning when the need for it arises (provided always that the new usage is generally accepted). To 'catch a cold' is good English now and has been so for hundreds of years. One rather wonders why the word 'disease' has got off scot-free, for it has wandered a long way from its original meaning of 'lack of elbow room' and there is nothing in its etymology which conveys the idea of a 'process' on which the editors rightly place so much stress.

More important, and more astonishing, is the contention that the early concentration, from De Bary onwards, on mycological studies led plant pathologists to equate diseases with pathogens and that this 'fallacy', as it is called, is still being perpetuated in the system of disease classification generally used in text-books; further, that the dominating influence of mycology has had the effect of arresting the development of plant pathology.

The first of these is so fantastic as to call for no answer. For a more reasonable explanation of the comparatively recent great development of plant pathology in all its branches, one can do no better than refer the editors to the last two pages of chapter 3 of the treatise.

Taken as a whole, this volume is a notable production, with many brilliantly written chapters, and it is to be welcomed as the first of its kind in the English language. The time was ripe for it and it will be a *sine qua non* in all institutions where plant pathological teaching and research are carried on. It has its inequalities, in part inseparable from its multi-authorship. There is also a fair sprinkling of errata, notably some misspellings and mistranslations of classical words. The main difficulty, however, lies in the demarcation of the six chapters which cover the physiological processes affected by plant disease. There is, perhaps, too much overlapping and some important topics receive meagre attention. At least one chapter heading, 'Growth is affected', is too wide; there the author wisely limited himself to the consideration of excessive growth and, by so doing, produced a compact and highly successful narrative. No doubt the years to come will give greater precision to the physiological processes of disease and thereby enable a further subdivision of the more 'unwieldy' topics to be made.

W. BROWN

British Parasitic Fungi. By W. C. MOORE (Cambridge University Press, 1959). Pp. xvi + 430. Price 45*s*.

One of the major problems confronting plant pathologists is the time required to consult all the literature relevant to the diseases which concern him. Even the research worker confined to one or few problems may find it onerous to sift the essential grains of past results from the vast chaff of many diverse publications. The general practitioner concerned with each and every pathogen occurring in Britain may at times find the task almost insuperable. Now the Director of the Plant Pathology Laboratory has placed at our disposal the store of information he has carefully compiled over many years. For all plant pathologists this book should satisfy a long felt want.

The first part of the book consists of a list of cultivated host plants arranged alphabetically according to their Latin names, with the English names in brackets. Under each host is a comprehensive (and no other word but comprehensive will suffice) list of the fungal pathogens recorded on it in Britain. As the type is clear and well set out it can be referred to rapidly and easily providing one can remember all the Latin host names. In case one cannot, the author assists by interspersing in the alphabetical order the common names of hosts most frequently encountered. Unfortunately it is not with these familiar friends that one's memory fails, but with those with which one has only a nodding acquaintance. Most of us will have no difficulty in identifying *Lycopersicon esculentum* as tomato and we may even know than an apple is no longer *Pyrus malus* but *Malus sylvestris* but one plant pathologist sought in vain for *Cochlearia armoracia* and then horseradish before remembering that he should look for *Armoracia lapathifolia.* Better botanists should not have this difficulty and the others will no doubt improve through their need to consult this volume frequently.

The second section of the book contains a list of fungal parasites again arranged alphabetically according to their Latin names. For full measure the fungi invading mushroom beds and pathogenic actinomycetes and myxomycetes are also included. Here the author has adopted an admittedly conservative attitude when there is any controversy over nomenclature. This may be criticized by ardent taxonomists but will be commended by the majority of plant pathologists who ever hope to see devised an acceptable formula for the conservation of familiar epithets and who hardly recognize their old enemy *Corticium solani* in the guise of *Pellicularia filamentosa.* As there is a very adequate synonymy for each name no one should have any serious difficulty. Where the perfect stage is known in Britain the fungus is listed under this but its imperfect stage, if this is better known, is also included in the alphabetical list with an appropriate cross reference.

Under each fungus is given the diseases which it causes with their common names when these exist. Here the author follows the British Mycological Society's List of Common British Plant Diseases, or rather precedes it as he has the advantage of having seen the draft of the next edition.

Such a list of pathogens and diseases is of great value but this part of the book contains far more than this. Short notes are given on the distribution and importance of each disease, based mainly on the records of the Plant Pathology Laboratory. These comments vary in length according to the importance of the diseases or, perhaps more correctly, according to the interest shown in them by the contributors to these records, but all are models of brevity combined with lucidity. Very occasionally perhaps one may be permitted the luxury of quibbling at the odd word. Does Take-All occur *mainly* on alkaline soils overlying chalk or limestone? This might be a matter of opinion but one feels that any error in fact is due to the omissions of the recorders rather than to any error of the compiler.

References are cited for the original description of each fungus and for all the important British papers on each disease it causes. The author states that he has not attempted to include every paper where there has been recent extensive research on a particular subject but his hope that nothing substantial has been omitted appears to be extremely well founded. As the published date of the book is 1959 it might have prevented some readers expecting too much if the author's finishing date had been stated in the preface. This was apparently the end of 1957 as I can find only one reference as late as January 1958. For each paper an indication is given of the contents and where there is an extensive literature the references are conveniently grouped according to their subject matter. Thus in a few minutes it is possible to group an accurate outline of the history of any important disease and the scope of the investigations carried out on it in Britain. Anyone who has tried to summarize scientific papers will appreciate the consummate skill with which so much information is compressed into so few words.

One can perhaps best assess the value of this work in relation to the author's aim 'to prepare a reference book from which the plant pathologist can readily trace the parasitic fungi which have been reported on cultivated plants in Great Britain, the diseases caused by these fungi, and British literature on the subject'. This was a most ambitious undertaking but the more one uses this volume the more aware one becomes of how magnificently it has succeeded. There are not many books that one can unreservedly say are essential for the British Plant Pathologist but this is undoubtedly one of the select few. As plant pathological investigation did not end in 1957 and seems likely to continue for some time we can only hope that in a not too distant future Mr Moore will return to his Herculean labours and provide us from time to time with either addenda or revised editions of this book which is certainly destined to become a standard work.

H. E. CROXALL

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Fifty Year Index to the Transactions, Vols. 1–30; 1896–1946. Compiled by G. R. Bisby. Price net, 21*s.* Postage, 9*d.*

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